



09/29/15

## Technical Report for

**Stantec Consulting Services Inc.**

**Sunoco - Marcus Hook Facility, PA**

**MHIC-AST-388 Closure/213402603**

**Accutest Job Number: JC4006**

**Sampling Date: 09/16/15**



### Report to:

**Stantec Consulting Services Inc.  
1060 Andrew Drive Suite 140  
West Chester, PA 19380  
jennifer.menges@stantec.com; stephanie.andrews@stantec.com;  
EDD@stantec.com; chris.mccardell@stantec.com  
ATTN: Jennifer Menges**

**Total number of pages in report: 252**



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

A handwritten signature in black ink that reads "Nancy T. Cole".

**Nancy Cole  
Laboratory Director**

**Client Service contact: Marie Meidhof 732-329-0200**

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC,  
OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TN, TX, VA, WV, DoD ELAP (L-A-B L2248)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>4</b>	
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>5</b>	
<b>Section 3: Summary of Hits .....</b>	<b>8</b>	
<b>Section 4: Sample Results .....</b>	<b>10</b>	
<b>4.1: JC4006-1: MHIC-388-8(5.0) .....</b>	11	
<b>4.2: JC4006-2: MHIC-388-9(5.0) .....</b>	16	
<b>4.3: JC4006-3: MHIC-388-10(5.0) .....</b>	21	
<b>4.4: JC4006-4: MHIC-388-11(5.0) .....</b>	26	
<b>Section 5: Misc. Forms .....</b>	<b>31</b>	
<b>5.1: Chain of Custody .....</b>	32	
<b>5.2: Sample Tracking Chronicle .....</b>	36	
<b>5.3: Internal Chain of Custody .....</b>	37	
<b>Section 6: GC/MS Volatiles - QC Data Summaries .....</b>	<b>40</b>	
<b>6.1: Method Blank Summary .....</b>	41	
<b>6.2: Blank Spike Summary .....</b>	42	
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	43	
<b>6.4: Instrument Performance Checks (BFB) .....</b>	44	
<b>6.5: Internal Standard Area Summaries .....</b>	47	
<b>6.6: Surrogate Recovery Summaries .....</b>	48	
<b>6.7: Initial and Continuing Calibration Summaries .....</b>	49	
<b>Section 7: GC/MS Volatiles - Raw Data .....</b>	<b>69</b>	
<b>7.1: Samples .....</b>	70	
<b>7.2: Method Blanks .....</b>	85	
<b>Section 8: GC/MS Semi-volatiles - QC Data Summaries .....</b>	<b>87</b>	
<b>8.1: Method Blank Summary .....</b>	88	
<b>8.2: Blank Spike Summary .....</b>	90	
<b>8.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	92	
<b>8.4: Instrument Performance Checks (DFTPP) .....</b>	94	
<b>8.5: Internal Standard Area Summaries .....</b>	99	
<b>8.6: Surrogate Recovery Summaries .....</b>	100	
<b>8.7: Initial and Continuing Calibration Summaries .....</b>	101	
<b>Section 9: GC/MS Semi-volatiles - Raw Data .....</b>	<b>118</b>	
<b>9.1: Samples .....</b>	119	
<b>9.2: Method Blanks .....</b>	135	
<b>Section 10: Metals Analysis - QC Data Summaries .....</b>	<b>137</b>	
<b>10.1: Inst QC MA37600: Co,Pb,Ni,V,Zn .....</b>	138	
<b>10.2: Inst QC MA37610: Co,Pb,Ni,V,Zn .....</b>	167	
<b>10.3: Prep QC MP89095: Co,Pb,Ni,V,Zn .....</b>	203	
<b>Section 11: General Chemistry - QC Data Summaries .....</b>	<b>213</b>	
<b>11.1: Percent Solids Raw Data Summary .....</b>	214	
<b>Section 12: Misc. Forms (Accutest Labs of New England, Inc.) .....</b>	<b>215</b>	
<b>12.1: Chain of Custody .....</b>	216	

# Table of Contents

-2-

<b>12.2:</b> Sample Tracking Chronicle .....	218
<b>12.3:</b> Internal Chain of Custody .....	219
<b>Section 13: GC Volatiles - QC Data (Accutest Labs of New England, Inc.) .....</b>	<b>220</b>
<b>13.1:</b> Method Blank Summary .....	221
<b>13.2:</b> Blank Spike Summary .....	222
<b>13.3:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	223
<b>13.4:</b> Surrogate Recovery Summaries .....	224
<b>13.5:</b> GC Surrogate Retention Time Summaries .....	225
<b>13.6:</b> Initial and Continuing Calibration Summaries .....	227
<b>Section 14: GC Volatiles - Raw Data (Accutest Labs of New England, Inc.) .....</b>	<b>232</b>
<b>14.1:</b> Samples .....	233
<b>14.2:</b> Method Blanks .....	249

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14



## Sample Summary

Stantec Consulting Services Inc.

Job No: JC4006

Sunoco - Marcus Hook Facility, PA

Project No: MHIC-AST-388 Closure/213402603

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JC4006-1	09/16/15	13:05 DH	09/16/15	SO	Soil	MHIC-388-8(5.0)
JC4006-2	09/16/15	13:20 DH	09/16/15	SO	Soil	MHIC-388-9(5.0)
JC4006-3	09/16/15	13:45 DH	09/16/15	SO	Soil	MHIC-388-10(5.0)
JC4006-4	09/16/15	14:00 DH	09/16/15	SO	Soil	MHIC-388-11(5.0)

---

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Stantec Consulting Services Inc.

**Job No** JC4006

**Site:** Sunoco - Marcus Hook Facility, PA

**Report Date** 9/29/2015 3:26:40 PM

On 09/16/2015, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a maximum corrected temperature of 3.4 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JC4006 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Volatiles by GCMS By Method SW846 8260C

**Matrix:** SO

**Batch ID:** V3C5637

- All samples were analyzed within the recommended method holding time.
- Sample(s) D75212-20MS, D75212-20MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for tert-Butylbenzene are outside control limits. High percent recoveries and no associated positive found in the QC batch.
- Matrix Spike Recovery(s) for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Ethylbenzene, Isopropylbenzene, sec-Butylbenzene, tert-Butylbenzene, Xylene (total) are outside control limits. Outside control limits due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for 1,3,5-Trimethylbenzene, Isopropylbenzene, sec-Butylbenzene, tert-Butylbenzene are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for MSD for Hexane are outside control limits. Outside control limits due to matrix interference.

### Extractables by GCMS By Method SW846 8270D

**Matrix:** SO

**Batch ID:** OP87306

- All samples were extracted within the recommended method holding time.
- Sample(s) JC3938-1MS, JC3938-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Volatiles by GC By Method SW846 8011

**Matrix:** SO

**Batch ID:** M:GBB3489

- The data for SW846 8011 meets quality control requirements.
- JC4006-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JC4006-1: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JC4006-4: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JC4006-3: Analysis performed at Accutest Laboratories, Marlborough, MA.

## Metals By Method SW846 6010C

**Matrix:** SO

**Batch ID:** MP89095

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC3239-2MS, JC3239-2MSD, JC3239-2SDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Zinc are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- Matrix Spike Duplicate Recovery(s) for Zinc are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- RPD(s) for MSD for Lead, Zinc are outside control limits. High rpd due to possible sample nonhomogeneity.

## Wet Chemistry By Method SM2540 G-97

**Matrix:** SO

**Batch ID:** GN32663

- The data for SM2540 G-97 meets quality control requirements.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Accutest New Jersey

**Job No** JC4006

**Site:** SECORPAE: Sunoco - Marcus Hook Facility, PA

**Report Date** 9/29/2015 10:08:04 AM

4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/16/2015 and were received at Accutest on 09/16/2015 properly preserved, at 0.3 Deg. C and intact. These Samples received an Accutest job number of JC4006. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GC By Method SW846 8011

**Matrix:** SO

**Batch ID:** OP44714

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC41500-4MS, MC41500-4MSD were used as the QC samples indicated.
- Continuing calibration check standard GBB3489-CC3489 (sig.#2), file BB64719, BB64741 for surrogates exceed criteria. Targets recovery satisfactory.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(JC4006).

**Summary of Hits**

Job Number: JC4006

Account: Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Collected: 09/16/15

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC4006-1	MHIC-388-8(5.0)					
Cobalt	3.3 B	6.1	0.049	mg/kg	SW846 6010C	
Lead	3.2	2.4	0.29	mg/kg	SW846 6010C	
Nickel	13.9	4.9	0.12	mg/kg	SW846 6010C	
Vanadium	14.6	6.1	0.091	mg/kg	SW846 6010C	
Zinc	18.4	6.1	0.93	mg/kg	SW846 6010C	
JC4006-2	MHIC-388-9(5.0)					
Cobalt	6.6	5.9	0.047	mg/kg	SW846 6010C	
Lead	8.1	2.4	0.28	mg/kg	SW846 6010C	
Nickel	13.1	4.7	0.11	mg/kg	SW846 6010C	
Vanadium	34.6	5.9	0.088	mg/kg	SW846 6010C	
Zinc	32.2	5.9	0.90	mg/kg	SW846 6010C	
JC4006-3	MHIC-388-10(5.0)					
Acenaphthene	0.0382 J	0.039	0.036	mg/kg	SW846 8270D	
Anthracene	0.0704	0.039	0.0033	mg/kg	SW846 8270D	
Benzo(a)anthracene	0.0731	0.039	0.0075	mg/kg	SW846 8270D	
Benzo(a)pyrene	0.0459	0.039	0.0082	mg/kg	SW846 8270D	
Benzo(b)fluoranthene	0.0328 J	0.039	0.0080	mg/kg	SW846 8270D	
Benzo(g,h,i)perylene	0.0221 J	0.039	0.012	mg/kg	SW846 8270D	
1,1'-Biphenyl	0.0258 J	0.077	0.0071	mg/kg	SW846 8270D	
Chrysene	0.141	0.039	0.0062	mg/kg	SW846 8270D	
bis(2-Ethylhexyl)phthalate	0.0495 J	0.077	0.013	mg/kg	SW846 8270D	
Fluoranthene	0.0596	0.039	0.0047	mg/kg	SW846 8270D	
Fluorene	0.0907	0.039	0.0046	mg/kg	SW846 8270D	
2-Methylnaphthalene	0.228	0.077	0.0072	mg/kg	SW846 8270D	
Naphthalene	0.0915	0.039	0.0062	mg/kg	SW846 8270D	
Phenanthrene	0.528	0.039	0.0043	mg/kg	SW846 8270D	
Pyrene	0.178	0.039	0.0048	mg/kg	SW846 8270D	
Cobalt	6.1 B	6.4	0.051	mg/kg	SW846 6010C	
Lead	13.6	2.5	0.30	mg/kg	SW846 6010C	
Nickel	13.0	5.1	0.12	mg/kg	SW846 6010C	
Vanadium	30.7	6.4	0.095	mg/kg	SW846 6010C	
Zinc	45.2	6.4	0.98	mg/kg	SW846 6010C	
JC4006-4	MHIC-388-11(5.0)					
Cobalt	6.5	6.2	0.049	mg/kg	SW846 6010C	
Lead	9.5	2.5	0.30	mg/kg	SW846 6010C	
Nickel	14.1	4.9	0.12	mg/kg	SW846 6010C	
Vanadium	36.9	6.2	0.093	mg/kg	SW846 6010C	

## Summary of Hits

Page 2 of 2

Job Number: JC4006

Account: Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Collected: 09/16/15

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Zinc		36.2	6.2	0.95	mg/kg	SW846 6010C



4

## Sample Results

---

## Report of Analysis

---

Accutest Laboratories

## Report of Analysis

Page 1 of 1

**Client Sample ID:** MHIC-388-8(5.0)  
**Lab Sample ID:** JC4006-1  
**Matrix:** SO - Soil  
**Method:** SW846 8260C  
**Project:** Sunoco - Marcus Hook Facility, PA

**Date Sampled:** 09/16/15  
**Date Received:** 09/16/15  
**Percent Solids:** 79.1

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	3C123409.D	1	09/21/15	PS	n/a	n/a	V3C5637

Initial Weight	
Run #1	5.8 g
Run #2	

## Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00054	0.00014	mg/kg	
108-88-3	Toluene	ND	0.0011	0.00023	mg/kg	
100-41-4	Ethylbenzene	ND	0.0011	0.00018	mg/kg	
1330-20-7	Xylene (total)	ND	0.0011	0.00030	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0011	0.00017	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0022	0.00019	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0022	0.00023	mg/kg	
110-82-7	Cyclohexane	ND	0.0022	0.00034	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0011	0.00015	mg/kg	
110-54-3	Hexane	ND	0.0054	0.00042	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0022	0.00012	mg/kg	
91-20-3	Naphthalene	ND	0.0054	0.00021	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0022	0.00022	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0022	0.00021	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-122%
17060-07-0	1,2-Dichloroethane-D4	97%		68-124%
2037-26-5	Toluene-D8	99%		77-125%
460-00-4	4-Bromofluorobenzene	97%		72-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.1

4

Accutest Laboratories

## Report of Analysis

Page 1 of 2

**Client Sample ID:** MHIC-388-8(5.0)  
**Lab Sample ID:** JC4006-1  
**Matrix:** SO - Soil  
**Method:** SW846 8270D SW846 3546  
**Project:** Sunoco - Marcus Hook Facility, PA

**Date Sampled:** 09/16/15  
**Date Received:** 09/16/15  
**Percent Solids:** 79.1

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	2M77586.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

	Initial Weight	Final Volume
Run #1	31.7 g	1.0 ml
Run #2		

## ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	0.20	0.073	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	0.20	0.17	mg/kg	
95-48-7	2-Methylphenol	ND	0.080	0.058	mg/kg	
	3&4-Methylphenol	ND	0.080	0.038	mg/kg	
100-02-7	4-Nitrophenol	ND	0.40	0.068	mg/kg	
108-95-2	Phenol	ND	0.080	0.030	mg/kg	
83-32-9	Acenaphthene	ND	0.040	0.038	mg/kg	
120-12-7	Anthracene	ND	0.040	0.0034	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.040	0.0077	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.040	0.0085	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.040	0.0082	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.040	0.012	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.040	0.0089	mg/kg	
92-52-4	1,1'-Biphenyl	ND	0.080	0.0074	mg/kg	
218-01-9	Chrysene	ND	0.040	0.0064	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.040	0.014	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.080	0.0047	mg/kg	
84-66-2	Diethyl phthalate	ND	0.080	0.0051	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.080	0.014	mg/kg	
206-44-0	Fluoranthene	ND	0.040	0.0049	mg/kg	
86-73-7	Fluorene	ND	0.040	0.0047	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.040	0.021	mg/kg	
91-57-6	2-Methylnaphthalene	ND	0.080	0.0075	mg/kg	
91-20-3	Naphthalene	ND	0.040	0.0064	mg/kg	
85-01-8	Phenanthrene	ND	0.040	0.0044	mg/kg	
129-00-0	Pyrene	ND	0.040	0.0050	mg/kg	
110-86-1	Pyridine	ND	0.080	0.020	mg/kg	
91-22-5	Quinoline	ND	0.20	0.015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		30-106%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.1

4

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	<b>MHIC-388-8(5.0)</b>	<b>Date Sampled:</b>	<b>09/16/15</b>
<b>Lab Sample ID:</b>	<b>JC4006-1</b>	<b>Date Received:</b>	<b>09/16/15</b>
<b>Matrix:</b>	<b>SO - Soil</b>		
<b>Method:</b>	<b>SW846 8270D SW846 3546</b>		
<b>Project:</b>	<b>Sunoco - Marcus Hook Facility, PA</b>	<b>Percent Solids:</b>	<b>79.1</b>

**ABN Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	63%		30-106%
118-79-6	2,4,6-Tribromophenol	63%		24-140%
4165-60-0	Nitrobenzene-d5	58%		26-122%
321-60-8	2-Fluorobiphenyl	73%		36-112%
1718-51-0	Terphenyl-d14	75%		36-132%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

**Client Sample ID:** MHIC-388-8(5.0)  
**Lab Sample ID:** JC4006-1  
**Matrix:** SO - Soil  
**Method:** SW846 8011 SW846 3550B  
**Project:** Sunoco - Marcus Hook Facility, PA

**Date Sampled:** 09/16/15  
**Date Received:** 09/16/15  
**Percent Solids:** 79.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	BB64737.D	1	09/25/15	AMA	09/22/15	M:OP44714	M:GBB3489
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0031	0.00052	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	141%		70-170%		
460-00-4	Bromofluorobenzene (S)	112%		70-170%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b>	<b>MHIC-388-8(5.0)</b>	<b>Date Sampled:</b>	<b>09/16/15</b>
<b>Lab Sample ID:</b>	<b>JC4006-1</b>	<b>Date Received:</b>	<b>09/16/15</b>
<b>Matrix:</b>	<b>SO - Soil</b>	<b>Percent Solids:</b>	<b>79.1</b>
<b>Project:</b>	<b>Sunoco - Marcus Hook Facility, PA</b>		

**Metals Analysis**

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	3.3 B	6.1	0.049	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	3.2	2.4	0.29	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.9	4.9	0.12	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	14.6	6.1	0.091	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	18.4	6.1	0.93	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA37600

(2) Prep QC Batch: MP89095

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

## Report of Analysis

Page 1 of 1

4.2  
4

**Client Sample ID:** MHIC-388-9(5.0)  
**Lab Sample ID:** JC4006-2  
**Matrix:** SO - Soil  
**Method:** SW846 8260C  
**Project:** Sunoco - Marcus Hook Facility, PA

**Date Sampled:** 09/16/15  
**Date Received:** 09/16/15  
**Percent Solids:** 81.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3C123410.D	1	09/21/15	PS	n/a	n/a	V3C5637
Run #2							

	Initial Weight
Run #1	5.6 g
Run #2	

## Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00055	0.00015	mg/kg	
108-88-3	Toluene	ND	0.0011	0.00023	mg/kg	
100-41-4	Ethylbenzene	ND	0.0011	0.00018	mg/kg	
1330-20-7	Xylene (total)	ND	0.0011	0.00030	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0011	0.00017	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0022	0.00019	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0022	0.00023	mg/kg	
110-82-7	Cyclohexane	ND	0.0022	0.00034	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0011	0.00015	mg/kg	
110-54-3	Hexane	ND	0.0055	0.00042	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0022	0.00012	mg/kg	
91-20-3	Naphthalene	ND	0.0055	0.00021	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0022	0.00022	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0022	0.00021	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-122%
17060-07-0	1,2-Dichloroethane-D4	98%		68-124%
2037-26-5	Toluene-D8	97%		77-125%
460-00-4	4-Bromofluorobenzene	97%		72-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 2

4.2  
4

Client Sample ID:	MHIC-388-9(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-2	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	81.8
Method:	SW846 8270D SW846 3546		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	2M77587.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

	Initial Weight	Final Volume
Run #1	31.4 g	1.0 ml
Run #2		

## ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	0.19	0.071	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	0.19	0.17	mg/kg	
95-48-7	2-Methylphenol	ND	0.078	0.056	mg/kg	
	3&4-Methylphenol	ND	0.078	0.037	mg/kg	
100-02-7	4-Nitrophenol	ND	0.39	0.066	mg/kg	
108-95-2	Phenol	ND	0.078	0.029	mg/kg	
83-32-9	Acenaphthene	ND	0.039	0.037	mg/kg	
120-12-7	Anthracene	ND	0.039	0.0034	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.039	0.0075	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.039	0.0083	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.039	0.0080	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.039	0.012	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.039	0.0087	mg/kg	
92-52-4	1,1'-Biphenyl	ND	0.078	0.0072	mg/kg	
218-01-9	Chrysene	ND	0.039	0.0063	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.039	0.014	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.078	0.0046	mg/kg	
84-66-2	Diethyl phthalate	ND	0.078	0.0049	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.078	0.014	mg/kg	
206-44-0	Fluoranthene	ND	0.039	0.0047	mg/kg	
86-73-7	Fluorene	ND	0.039	0.0046	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.039	0.020	mg/kg	
91-57-6	2-Methylnaphthalene	ND	0.078	0.0073	mg/kg	
91-20-3	Naphthalene	ND	0.039	0.0062	mg/kg	
85-01-8	Phenanthrene	ND	0.039	0.0043	mg/kg	
129-00-0	Pyrene	ND	0.039	0.0049	mg/kg	
110-86-1	Pyridine	ND	0.078	0.019	mg/kg	
91-22-5	Quinoline	ND	0.19	0.014	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		30-106%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	<b>MHIC-388-9(5.0)</b>	<b>Date Sampled:</b>	<b>09/16/15</b>
<b>Lab Sample ID:</b>	<b>JC4006-2</b>	<b>Date Received:</b>	<b>09/16/15</b>
<b>Matrix:</b>	<b>SO - Soil</b>		
<b>Method:</b>	<b>SW846 8270D SW846 3546</b>		
<b>Project:</b>	<b>Sunoco - Marcus Hook Facility, PA</b>	<b>Percent Solids:</b>	<b>81.8</b>

**ABN Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	61%		30-106%
118-79-6	2,4,6-Tribromophenol	68%		24-140%
4165-60-0	Nitrobenzene-d5	60%		26-122%
321-60-8	2-Fluorobiphenyl	74%		36-112%
1718-51-0	Terphenyl-d14	80%		36-132%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

4.2  
4

**Client Sample ID:** MHIC-388-9(5.0)  
**Lab Sample ID:** JC4006-2  
**Matrix:** SO - Soil  
**Method:** SW846 8011 SW846 3550B  
**Project:** Sunoco - Marcus Hook Facility, PA

Date Sampled: 09/16/15  
 Date Received: 09/16/15  
 Percent Solids: 81.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	BB64738.D	1	09/25/15	AMA	09/22/15	M:OP44714	M:GBB3489
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0030	0.00050	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	147%		70-170%		
460-00-4	Bromofluorobenzene (S)	114%		70-170%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID:	MHIC-388-9(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-2	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	81.8
Project:	Sunoco - Marcus Hook Facility, PA		

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	6.6	5.9	0.047	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	8.1	2.4	0.28	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.1	4.7	0.11	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	34.6	5.9	0.088	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	32.2	5.9	0.90	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA37600

(2) Prep QC Batch: MP89095

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

## Report of Analysis

Page 1 of 1

4.3  
4

Client Sample ID:	MHIC-388-10(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-3	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	80.2
Method:	SW846 8260C		
Project:	Sunoco - Marcus Hook Facility, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3C123411.D	1	09/22/15	PS	n/a	n/a	V3C5637
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

## Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00061	0.00016	mg/kg	
108-88-3	Toluene	ND	0.0012	0.00025	mg/kg	
100-41-4	Ethylbenzene	ND	0.0012	0.00020	mg/kg	
1330-20-7	Xylene (total)	ND	0.0012	0.00033	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0012	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0024	0.00021	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0024	0.00026	mg/kg	
110-82-7	Cyclohexane	ND	0.0024	0.00039	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0012	0.00016	mg/kg	
110-54-3	Hexane	ND	0.0061	0.00047	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0024	0.00013	mg/kg	
91-20-3	Naphthalene	ND	0.0061	0.00023	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0024	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0024	0.00023	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-122%
17060-07-0	1,2-Dichloroethane-D4	99%		68-124%
2037-26-5	Toluene-D8	98%		77-125%
460-00-4	4-Bromofluorobenzene	98%		72-130%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 2

4.3

4

Client Sample ID:	MHIC-388-10(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-3	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	80.2
Method:	SW846 8270D SW846 3546		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	2M77592.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

	Initial Weight	Final Volume
Run #1	32.3 g	1.0 ml
Run #2		

## ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	0.19	0.071	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	0.19	0.17	mg/kg	
95-48-7	2-Methylphenol	ND	0.077	0.056	mg/kg	
	3&4-Methylphenol	ND	0.077	0.037	mg/kg	
100-02-7	4-Nitrophenol	ND	0.39	0.066	mg/kg	
108-95-2	Phenol	ND	0.077	0.029	mg/kg	
83-32-9	Acenaphthene	0.0382	0.039	0.036	mg/kg	J
120-12-7	Anthracene	0.0704	0.039	0.0033	mg/kg	
56-55-3	Benzo(a)anthracene	0.0731	0.039	0.0075	mg/kg	
50-32-8	Benzo(a)pyrene	0.0459	0.039	0.0082	mg/kg	
205-99-2	Benzo(b)fluoranthene	0.0328	0.039	0.0080	mg/kg	J
191-24-2	Benzo(g,h,i)perylene	0.0221	0.039	0.012	mg/kg	J
207-08-9	Benzo(k)fluoranthene	ND	0.039	0.0086	mg/kg	
92-52-4	1,1'-Biphenyl	0.0258	0.077	0.0071	mg/kg	J
218-01-9	Chrysene	0.141	0.039	0.0062	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.039	0.014	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.077	0.0046	mg/kg	
84-66-2	Diethyl phthalate	ND	0.077	0.0049	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	0.0495	0.077	0.013	mg/kg	J
206-44-0	Fluoranthene	0.0596	0.039	0.0047	mg/kg	
86-73-7	Fluorene	0.0907	0.039	0.0046	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.039	0.020	mg/kg	
91-57-6	2-Methylnaphthalene	0.228	0.077	0.0072	mg/kg	
91-20-3	Naphthalene	0.0915	0.039	0.0062	mg/kg	
85-01-8	Phenanthrene	0.528	0.039	0.0043	mg/kg	
129-00-0	Pyrene	0.178	0.039	0.0048	mg/kg	
110-86-1	Pyridine	ND	0.077	0.019	mg/kg	
91-22-5	Quinoline	ND	0.19	0.014	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%		30-106%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	<b>MHIC-388-10(5.0)</b>	<b>Date Sampled:</b>	<b>09/16/15</b>
<b>Lab Sample ID:</b>	<b>JC4006-3</b>	<b>Date Received:</b>	<b>09/16/15</b>
<b>Matrix:</b>	<b>SO - Soil</b>		
<b>Method:</b>	<b>SW846 8270D SW846 3546</b>		
<b>Project:</b>	<b>Sunoco - Marcus Hook Facility, PA</b>	<b>Percent Solids:</b>	<b>80.2</b>

**ABN Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	59%		30-106%
118-79-6	2,4,6-Tribromophenol	61%		24-140%
4165-60-0	Nitrobenzene-d5	52%		26-122%
321-60-8	2-Fluorobiphenyl	69%		36-112%
1718-51-0	Terphenyl-d14	67%		36-132%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

4.3  
4

**Client Sample ID:** MHIC-388-10(5.0)  
**Lab Sample ID:** JC4006-3  
**Matrix:** SO - Soil  
**Method:** SW846 8011 SW846 3550B  
**Project:** Sunoco - Marcus Hook Facility, PA

Date Sampled: 09/16/15  
 Date Received: 09/16/15  
 Percent Solids: 80.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	BB64739.D	1	09/25/15	AMA	09/22/15	M:OP44714	M:GBB3489
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0031	0.00052	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	137%		70-170%		
460-00-4	Bromofluorobenzene (S)	128%		70-170%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID:	MHIC-388-10(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-3	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	80.2
Project:	Sunoco - Marcus Hook Facility, PA		

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	6.1 B	6.4	0.051	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	13.6	2.5	0.30	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	13.0	5.1	0.12	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	30.7	6.4	0.095	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	45.2	6.4	0.98	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA37600

(2) Prep QC Batch: MP89095

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL

Accutest Laboratories

## Report of Analysis

Page 1 of 1

Client Sample ID:	MHIC-388-11(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-4	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	82.5
Method:	SW846 8260C		
Project:	Sunoco - Marcus Hook Facility, PA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3C123412.D	1	09/22/15	PS	n/a	n/a	V3C5637
Run #2							

Initial Weight
Run #1      4.4 g
Run #2

## Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.00069	0.00018	mg/kg	
108-88-3	Toluene	ND	0.0014	0.00029	mg/kg	
100-41-4	Ethylbenzene	ND	0.0014	0.00022	mg/kg	
1330-20-7	Xylene (total)	ND	0.0014	0.00038	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0014	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0028	0.00023	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0028	0.00029	mg/kg	
110-82-7	Cyclohexane	ND	0.0028	0.00044	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0014	0.00018	mg/kg	
110-54-3	Hexane	ND	0.0069	0.00053	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0028	0.00015	mg/kg	
91-20-3	Naphthalene	ND	0.0069	0.00026	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0028	0.00027	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0028	0.00026	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		70-122%
17060-07-0	1,2-Dichloroethane-D4	99%		68-124%
2037-26-5	Toluene-D8	100%		77-125%
460-00-4	4-Bromofluorobenzene	95%		72-130%

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

44

Accutest Laboratories

## Report of Analysis

Page 1 of 2

**Client Sample ID:** MHIC-388-11(5.0)  
**Lab Sample ID:** JC4006-4  
**Matrix:** SO - Soil  
**Method:** SW846 8270D SW846 3546  
**Project:** Sunoco - Marcus Hook Facility, PA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2M77588.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

## ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	0.20	0.073	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	0.20	0.17	mg/kg	
95-48-7	2-Methylphenol	ND	0.080	0.058	mg/kg	
	3&4-Methylphenol	ND	0.080	0.038	mg/kg	
100-02-7	4-Nitrophenol	ND	0.40	0.068	mg/kg	
108-95-2	Phenol	ND	0.080	0.030	mg/kg	
83-32-9	Acenaphthene	ND	0.040	0.038	mg/kg	
120-12-7	Anthracene	ND	0.040	0.0034	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.040	0.0077	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.040	0.0085	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.040	0.0082	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.040	0.012	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.040	0.0089	mg/kg	
92-52-4	1,1'-Biphenyl	ND	0.080	0.0074	mg/kg	
218-01-9	Chrysene	ND	0.040	0.0064	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.040	0.014	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.080	0.0047	mg/kg	
84-66-2	Diethyl phthalate	ND	0.080	0.0051	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.080	0.014	mg/kg	
206-44-0	Fluoranthene	ND	0.040	0.0049	mg/kg	
86-73-7	Fluorene	ND	0.040	0.0047	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.040	0.021	mg/kg	
91-57-6	2-Methylnaphthalene	ND	0.080	0.0075	mg/kg	
91-20-3	Naphthalene	ND	0.040	0.0064	mg/kg	
85-01-8	Phenanthrene	ND	0.040	0.0044	mg/kg	
129-00-0	Pyrene	ND	0.040	0.0050	mg/kg	
110-86-1	Pyridine	ND	0.080	0.020	mg/kg	
91-22-5	Quinoline	ND	0.20	0.015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		30-106%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	<b>MHIC-388-11(5.0)</b>	<b>Date Sampled:</b>	<b>09/16/15</b>
<b>Lab Sample ID:</b>	<b>JC4006-4</b>	<b>Date Received:</b>	<b>09/16/15</b>
<b>Matrix:</b>	<b>SO - Soil</b>		
<b>Method:</b>	<b>SW846 8270D SW846 3546</b>		
<b>Project:</b>	<b>Sunoco - Marcus Hook Facility, PA</b>	<b>Percent Solids:</b>	<b>82.5</b>

**ABN Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	63%		30-106%
118-79-6	2,4,6-Tribromophenol	64%		24-140%
4165-60-0	Nitrobenzene-d5	62%		26-122%
321-60-8	2-Fluorobiphenyl	76%		36-112%
1718-51-0	Terphenyl-d14	77%		36-132%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

**Client Sample ID:** MHIC-388-11(5.0)  
**Lab Sample ID:** JC4006-4  
**Matrix:** SO - Soil  
**Method:** SW846 8011 SW846 3550B  
**Project:** Sunoco - Marcus Hook Facility, PA

**Date Sampled:** 09/16/15  
**Date Received:** 09/16/15  
**Percent Solids:** 82.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	BB64740.D	1	09/25/15	AMA	09/22/15	M:OP44714	M:GBB3489
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0030	0.00050	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	152%		70-170%		
460-00-4	Bromofluorobenzene (S)	120%		70-170%		

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID:	MHIC-388-11(5.0)	Date Sampled:	09/16/15
Lab Sample ID:	JC4006-4	Date Received:	09/16/15
Matrix:	SO - Soil	Percent Solids:	82.5
Project:	Sunoco - Marcus Hook Facility, PA		

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Cobalt	6.5	6.2	0.049	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Lead	9.5	2.5	0.30	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Nickel	14.1	4.9	0.12	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Vanadium	36.9	6.2	0.093	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>
Zinc	36.2	6.2	0.95	mg/kg	1	09/18/15	09/21/15 BS	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA37600

(2) Prep QC Batch: MP89095

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL



## Misc. Forms

---

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

**CHAIN OF CUSTODY**

PAGE 1 OF 1

Client / Reporting Information		Project Information		FED-EX Tracking #	Boite Order Control #
Company Name: <b>Stan tec</b> Street Address: City: <b>Lancaster</b> State: <b>PA</b> Zip: <b>17601</b> Project Contact: Name: <b>Andrew Dr</b> Email: <b>lancaster@stan-tec.com</b> Phone #: <b>(717) 299-2500</b> Fax #: <b>(717) 299-2501</b> Sampler(s) Name(s): <b>Jennifer Merges</b> Phone #: <b>(484) 995-9740</b>		Project Name: <b>MHIC - AST-388 Closure</b> Street: <b>100 Green St</b> City: <b>Marcus Hook</b> State: <b>PA</b> Zip: <b>19343</b> Project #: <b>2134102G03</b> Client Purchase Order #:		Accutest Quote #	Accutest Job #
Requested Analysis (see TEST CODE sheet)					
Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SE - Slurry OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank RB - Rinse Blank TB - Trip Blank					
LAB USE ONLY <b>B6</b> <b>E77T1</b> <b>1Y4U</b> <b>49122</b>					
INITIAL ASSESSMENT <b>IA-JR</b> LABEL VERIFICATION <b>OB</b>					
Comments / Special Instructions <i>*See comprehensive list attached</i>					
Turnaround Time (Business days) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other		Approved By (Accutest PM): _____ Date: _____ Data Deliverable Information <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULL/TI (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting <small>NJ Reduced = Results + QC Summary            NJ Data of Known Quality Protocol Reporting = Results + QC Summary + Partial Raw data</small>			
Emergency & Rush T/A data available VIA Lablink		Sample Custody must be documented below each time samples change possession, including courier delivery. Relinquished by Sampler: 1 <b>Chas Bleng</b> Received By: 1 <b>Chas Bleng</b> Date Time: <b>9/16/15 1610</b> Relinquished by Sampler: 2 <b>Chas Bleng</b> Received By: 2 <b>Chas Bleng</b> Date Time: <b>9/16/15 18:25</b> Relinquished by Sampler: 3 <b>Chas Bleng</b> Received By: 3 <b>Chas Bleng</b> Date Time: <b>9/16/15 18:25</b> Relinquished by Sampler: 4 <b>Chas Bleng</b> Received By: 4 <b>Chas Bleng</b> Date Time: <b>9/16/15 18:25</b> Relinquished by Sampler: 5 <b>Chas Bleng</b> Received By: 5 <b>Chas Bleng</b> Date Time: <b>9/16/15 18:25</b>			

**JC4006: Chain of Custody**

**Page 1 of 4**



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JC4006 Client: \_\_\_\_\_ Project: \_\_\_\_\_  
Date / Time Received: 9/16/2015 6:25:00 PM Delivery Method: \_\_\_\_\_ Airbill #'s: \_\_\_\_\_

Cooler Temps (Raw Measured) °C: Cooler 1: (3.4);

Cooler Temps (Corrected) °C: Cooler 1: (3.6);

Cooler Security		Y or N		Y or N	
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>		

Cooler Temperature		Y or N	
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Cooler temp verification:		IR Gun	
3. Cooler media:		Ice (Bag)	
4. No. Coolers:		1	

Quality Control Preservation		Y or N		N/A
1. Trip Blank present / cooler:		<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Trip Blank listed on COC:		<input checked="" type="checkbox"/> <input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4. VOCs headspace free:		<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>		

Comments

Accutest Laboratories  
V:732.329.0200

2235 US Highway 130  
P: 732.329.3499

Dayton, New Jersey  
www.accutest.com

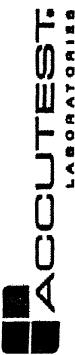
5.1

5

Sample Integrity - Documentation		Y or N	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sample Integrity - Condition		Y or N	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
Sample Integrity - Instructions		Y or N	N/A
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**JC4006: Chain of Custody**

**Page 2 of 4**



JOB NUMBER: JC4006

Chain of  
Custody

NABS? Y / N  Circle.

Circle either D<sub>1</sub>H<sub>2</sub>O or NaHSO<sub>4</sub>.

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

SAMPLE #	MeOH VIAL	D <sub>1</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>	D <sub>2</sub> H <sub>2</sub> O / NaHSO <sub>4</sub>
1	120	419	420
2	544	1979	1980
3	547	1977	1978
4	114	1931	1932

**Job Change Order:**

JC4006

Requested Date: 9/28/2015  
Account Name: Stantec Consulting Services Inc.  
Project Description: Sunoco - Marcus Hook Facility, PA  
CSR: mariem

Received Date: 9/16/2015  
Due Date: 9/30/2015  
Deliverable: REDT2  
TAT (Days): 14

Sample #: JC4006-11 to 4

**Change:**  
Please revise the field ID's, deleting the "end" depth for each.

Dept: TAT:  
14

Above Changes Per: M. Schaeffer

Date/Time: 9/28/2015 1:24:41 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1

**JC4006: Chain of Custody**  
**Page 4 of 4**

Accutest Laboratories

## Internal Sample Tracking Chronicle

Stantec Consulting Services Inc.

Job No: JC4006

Sunoco - Marcus Hook Facility, PA

Project No: MHIC-AST-388 Closure/213402603

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JC4006-1 MHIC-388-8(5.0)	Collected: 16-SEP-15 13:05 By: DH		Received: 16-SEP-15 By: AS			
JC4006-1	SW846 8270D	18-SEP-15 16:30	AN	18-SEP-15	NR	AB8270SL
JC4006-1	SM2540 G-97	18-SEP-15 17:00	KP			%SOL
JC4006-1	SW846 6010C	21-SEP-15 12:54	BS	18-SEP-15	RM	CO,NI,PB,V,ZN
JC4006-1	SW846 8260C	21-SEP-15 23:11	PS			V8260SL2
JC4006-1	SW846 8011	25-SEP-15 02:12	AMA	22-SEP-15	AMA	V8011EDB
JC4006-2 MHIC-388-9(5.0)	Collected: 16-SEP-15 13:20 By: DH		Received: 16-SEP-15 By: AS			
JC4006-2	SW846 8270D	18-SEP-15 16:57	AN	18-SEP-15	NR	AB8270SL
JC4006-2	SM2540 G-97	18-SEP-15 17:00	KP			%SOL
JC4006-2	SW846 6010C	21-SEP-15 12:57	BS	18-SEP-15	RM	CO,NI,PB,V,ZN
JC4006-2	SW846 8260C	21-SEP-15 23:39	PS			V8260SL2
JC4006-2	SW846 8011	25-SEP-15 02:40	AMA	22-SEP-15	AMA	V8011EDB
JC4006-3 MHIC-388-10(5.0)	Collected: 16-SEP-15 13:45 By: DH		Received: 16-SEP-15 By: AS			
JC4006-3	SM2540 G-97	18-SEP-15 17:00	KP			%SOL
JC4006-3	SW846 8270D	18-SEP-15 19:10	AN	18-SEP-15	NR	AB8270SL
JC4006-3	SW846 6010C	21-SEP-15 13:00	BS	18-SEP-15	RM	CO,NI,PB,V,ZN
JC4006-3	SW846 8260C	22-SEP-15 00:06	PS			V8260SL2
JC4006-3	SW846 8011	25-SEP-15 03:08	AMA	22-SEP-15	AMA	V8011EDB
JC4006-4 MHIC-388-11(5.0)	Collected: 16-SEP-15 14:00 By: DH		Received: 16-SEP-15 By: AS			
JC4006-4	SM2540 G-97	18-SEP-15 17:00	KP			%SOL
JC4006-4	SW846 8270D	18-SEP-15 17:24	AN	18-SEP-15	NR	AB8270SL
JC4006-4	SW846 6010C	21-SEP-15 13:03	BS	18-SEP-15	RM	CO,NI,PB,V,ZN
JC4006-4	SW846 8260C	22-SEP-15 00:34	PS			V8260SL2
JC4006-4	SW846 8011	25-SEP-15 03:36	AMA	22-SEP-15	AMA	V8011EDB

## Accutest Internal Chain of Custody

Page 1 of 3

Job Number: JC4006  
 Account: SECORPAE Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA  
 Received: 09/16/15

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC4006-1.1	Secured Storage	Arielle Cocozza	09/18/15 03:28	Retrieve from Storage
JC4006-1.1	Arielle Cocozza	Nida Rizvi	09/18/15 03:58	Custody Transfer
JC4006-1.1	Nida Rizvi	Secured Storage	09/18/15 08:17	Return to Storage
JC4006-1.1	Secured Storage	Todd Shoemaker	09/18/15 15:26	Retrieve from Storage
JC4006-1.1	Todd Shoemaker	Secured Staging Area	09/18/15 15:26	Return to Storage
JC4006-1.1	Secured Staging Area	Radhika Mistry	09/18/15 17:03	Retrieve from Storage
JC4006-1.1	Radhika Mistry	Secured Storage	09/18/15 17:11	Return to Storage
JC4006-1.1.1	Nida Rizvi	Organics Prep	09/18/15 04:01	Extract from JC4006-1.1
JC4006-1.1.1	Organics Prep	Nida Rizvi	09/18/15 10:20	Extract from JC4006-1.1
JC4006-1.1.1	Nida Rizvi	Extract Storage	09/18/15 10:20	Return to Storage
JC4006-1.1.1	Extract Storage	Ashley Noble	09/18/15 12:42	Retrieve from Storage
JC4006-1.1.1	Ashley Noble	GCMS2M	09/18/15 12:42	Load on Instrument
JC4006-1.1.1	GCMS2M	Ashley Noble	09/18/15 17:07	Unload from Instrument
JC4006-1.1.1	Ashley Noble	Extract Freezer	09/18/15 17:07	Return to Storage
JC4006-1.2	Secured Storage	Alfredo Crespo	09/18/15 07:37	Retrieve from Storage
JC4006-1.2	Alfredo Crespo	Secured Staging Area	09/18/15 07:37	Return to Storage
JC4006-1.2	Secured Staging Area	Kruti Patel	09/18/15 09:10	Retrieve from Storage
JC4006-1.2	Kruti Patel	Secured Storage	09/18/15 12:41	Return to Storage
JC4006-1.5	Secured Storage	Prashant Shukla	09/21/15 16:57	Retrieve from Storage
JC4006-1.5	Prashant Shukla	GCMS3C	09/21/15 16:57	Load on Instrument
JC4006-1.5	GCMS3C	Prashant Shukla	09/22/15 10:10	Unload from Instrument
JC4006-1.5	Prashant Shukla		09/22/15 10:10	Depleted
JC4006-2.1	Secured Storage	Arielle Cocozza	09/18/15 03:28	Retrieve from Storage
JC4006-2.1	Arielle Cocozza	Nida Rizvi	09/18/15 03:58	Custody Transfer
JC4006-2.1	Nida Rizvi	Secured Storage	09/18/15 08:17	Return to Storage
JC4006-2.1	Secured Storage	Todd Shoemaker	09/18/15 15:26	Retrieve from Storage
JC4006-2.1	Todd Shoemaker	Secured Staging Area	09/18/15 15:26	Return to Storage
JC4006-2.1	Secured Staging Area	Radhika Mistry	09/18/15 17:03	Retrieve from Storage
JC4006-2.1	Radhika Mistry	Secured Storage	09/18/15 17:11	Return to Storage
JC4006-2.1.1	Nida Rizvi	Organics Prep	09/18/15 04:01	Extract from JC4006-2.1
JC4006-2.1.1	Organics Prep	Nida Rizvi	09/18/15 10:20	Extract from JC4006-2.1
JC4006-2.1.1	Nida Rizvi	Extract Storage	09/18/15 10:20	Return to Storage
JC4006-2.1.1	Extract Storage	Ashley Noble	09/18/15 12:42	Retrieve from Storage
JC4006-2.1.1	Ashley Noble	GCMS2M	09/18/15 12:42	Load on Instrument
JC4006-2.1.1	GCMS2M	Ashley Noble	09/22/15 09:16	Unload from Instrument
JC4006-2.1.1	Ashley Noble	Extract Freezer	09/22/15 09:16	Return to Storage
JC4006-2.2	Secured Storage	Alfredo Crespo	09/18/15 07:37	Retrieve from Storage
JC4006-2.2	Alfredo Crespo	Secured Staging Area	09/18/15 07:37	Return to Storage

## Accutest Internal Chain of Custody

Page 2 of 3

Job Number: JC4006  
 Account: SECORPAE Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA  
 Received: 09/16/15

Sample/Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC4006-2.2	Secured Staging Area	Kruti Patel	09/18/15 09:10	Retrieve from Storage
JC4006-2.2	Kruti Patel	Secured Storage	09/18/15 12:41	Return to Storage
JC4006-2.5	Secured Storage	Prashant Shukla	09/21/15 16:57	Retrieve from Storage
JC4006-2.5	Prashant Shukla	GCMS3C	09/21/15 16:57	Load on Instrument
JC4006-2.5	GCMS3C	Prashant Shukla	09/22/15 10:10	Unload from Instrument
JC4006-2.5	Prashant Shukla		09/22/15 10:10	Depleted
JC4006-3.1	Secured Storage	Arielle Cocozza	09/18/15 03:28	Retrieve from Storage
JC4006-3.1	Arielle Cocozza	Nida Rizvi	09/18/15 03:58	Custody Transfer
JC4006-3.1	Nida Rizvi	Secured Storage	09/18/15 08:17	Return to Storage
JC4006-3.1	Secured Storage	Todd Shoemaker	09/18/15 15:26	Retrieve from Storage
JC4006-3.1	Todd Shoemaker	Secured Staging Area	09/18/15 15:26	Return to Storage
JC4006-3.1	Secured Staging Area	Radhika Mistry	09/18/15 17:03	Retrieve from Storage
JC4006-3.1	Radhika Mistry	Secured Storage	09/18/15 17:11	Return to Storage
JC4006-3.1.1	Nida Rizvi	Organics Prep	09/18/15 04:01	Extract from JC4006-3.1
JC4006-3.1.1	Organics Prep	Nida Rizvi	09/18/15 10:20	Extract from JC4006-3.1
JC4006-3.1.1	Nida Rizvi	Extract Storage	09/18/15 10:20	Return to Storage
JC4006-3.1.1	Extract Storage	Ashley Noble	09/18/15 12:42	Retrieve from Storage
JC4006-3.1.1	Ashley Noble	GCMS2M	09/18/15 12:42	Load on Instrument
JC4006-3.1.1	GCMS2M	Ashley Noble	09/22/15 09:16	Unload from Instrument
JC4006-3.1.1	Ashley Noble	Extract Freezer	09/22/15 09:16	Return to Storage
JC4006-3.2	Secured Storage	Alfredo Crespo	09/18/15 07:37	Retrieve from Storage
JC4006-3.2	Alfredo Crespo	Secured Staging Area	09/18/15 07:37	Return to Storage
JC4006-3.2	Secured Staging Area	Kruti Patel	09/18/15 09:10	Retrieve from Storage
JC4006-3.2	Kruti Patel	Secured Storage	09/18/15 12:41	Return to Storage
JC4006-3.5	Secured Storage	Prashant Shukla	09/21/15 16:57	Retrieve from Storage
JC4006-3.5	Prashant Shukla	GCMS3C	09/21/15 16:57	Load on Instrument
JC4006-3.5	GCMS3C	Prashant Shukla	09/22/15 10:10	Unload from Instrument
JC4006-3.5	Prashant Shukla		09/22/15 10:10	Depleted
JC4006-4.1	Secured Storage	Arielle Cocozza	09/18/15 03:28	Retrieve from Storage
JC4006-4.1	Arielle Cocozza	Nida Rizvi	09/18/15 03:58	Custody Transfer
JC4006-4.1	Nida Rizvi	Secured Storage	09/18/15 08:17	Return to Storage
JC4006-4.1	Secured Storage	Todd Shoemaker	09/18/15 15:26	Retrieve from Storage
JC4006-4.1	Todd Shoemaker	Secured Staging Area	09/18/15 15:26	Return to Storage
JC4006-4.1	Secured Staging Area	Radhika Mistry	09/18/15 17:03	Retrieve from Storage
JC4006-4.1	Radhika Mistry	Secured Storage	09/18/15 17:11	Return to Storage
JC4006-4.1.1	Nida Rizvi	Organics Prep	09/18/15 04:01	Extract from JC4006-4.1
JC4006-4.1.1	Organics Prep	Nida Rizvi	09/18/15 10:20	Extract from JC4006-4.1

## Accutest Internal Chain of Custody

Page 3 of 3

Job Number: JC4006  
Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA  
Received: 09/16/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC4006-4.1.1	Nida Rizvi	Extract Storage	09/18/15 10:20	Return to Storage
JC4006-4.1.1	Extract Storage	Ashley Noble	09/18/15 12:42	Retrieve from Storage
JC4006-4.1.1	Ashley Noble	GCMS2M	09/18/15 12:42	Load on Instrument
JC4006-4.1.1	GCMS2M	Ashley Noble	09/22/15 09:16	Unload from Instrument
JC4006-4.1.1	Ashley Noble	Extract Freezer	09/22/15 09:16	Return to Storage
JC4006-4.2	Secured Storage	Alfredo Crespo	09/18/15 07:37	Retrieve from Storage
JC4006-4.2	Alfredo Crespo	Secured Staging Area	09/18/15 07:37	Return to Storage
JC4006-4.2	Secured Staging Area	Kruti Patel	09/18/15 09:10	Retrieve from Storage
JC4006-4.2	Kruti Patel	Secured Storage	09/18/15 12:41	Return to Storage
JC4006-4.5	Secured Storage	Prashant Shukla	09/21/15 16:57	Retrieve from Storage
JC4006-4.5	Prashant Shukla	GCMS3C	09/21/15 16:57	Load on Instrument
JC4006-4.5	GCMS3C	Prashant Shukla	09/22/15 10:10	Unload from Instrument
JC4006-4.5	Prashant Shukla		09/22/15 10:10	Depleted



## GC/MS Volatiles

---

### QC Data Summaries

---

**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries



**Method Blank Summary**

Job Number: JC4006  
 Account: SECORPAE Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3C5637-MB	3C123395.D	1	09/21/15	PS	n/a	n/a	V3C5637

The QC reported here applies to the following samples:

Method: SW846 8260C

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/kg	
135-98-8	sec-Butylbenzene	ND	2.0	0.17	ug/kg	
98-06-6	tert-Butylbenzene	ND	2.0	0.21	ug/kg	
110-82-7	Cyclohexane	ND	2.0	0.32	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.13	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.16	ug/kg	
110-54-3	Hexane	ND	5.0	0.39	ug/kg	
98-82-8	Isopropylbenzene	ND	2.0	0.11	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.15	ug/kg	
91-20-3	Naphthalene	ND	5.0	0.19	ug/kg	
108-88-3	Toluene	ND	1.0	0.21	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.20	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.19	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.27	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	91% 70-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	98% 77-125%
460-00-4	4-Bromofluorobenzene	93% 72-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

**Blank Spike Summary**

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3C5637-BS	3C123396.D	1	09/21/15	PS	n/a	n/a	V3C5637

The QC reported here applies to the following samples:

Method: SW846 8260C

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	45.8	92	77-122
135-98-8	sec-Butylbenzene	50	53.3	107	70-125
98-06-6	tert-Butylbenzene	50	69.9	140* a	70-126
110-82-7	Cyclohexane	50	48.0	96	66-131
107-06-2	1,2-Dichloroethane	50	50.4	101	77-140
100-41-4	Ethylbenzene	50	51.1	102	75-121
110-54-3	Hexane	50	43.8	88	37-137
98-82-8	Isopropylbenzene	50	53.5	107	70-126
1634-04-4	Methyl Tert Butyl Ether	100	93.1	93	77-121
91-20-3	Naphthalene	50	54.2	108	74-126
108-88-3	Toluene	50	48.0	96	75-123
95-63-6	1,2,4-Trimethylbenzene	50	52.1	104	75-126
108-67-8	1,3,5-Trimethylbenzene	50	52.4	105	72-124
1330-20-7	Xylene (total)	150	156	104	76-121

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	94%	70-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	99%	77-125%
460-00-4	4-Bromofluorobenzene	97%	72-130%

(a) High percent recoveries and no associated positive found in the QC batch.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D75212-20MS	3C123397.D	1	09/21/15	PS	n/a	n/a	V3C5637
D75212-20MSD	3C123398.D	1	09/21/15	PS	n/a	n/a	V3C5637
D75212-20	3C123400.D	1	09/21/15	PS	n/a	n/a	V3C5637

The QC reported here applies to the following samples:

Method: SW846 8260C

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	D75212-20		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	ug/kg	%		
71-43-2	Benzene	ND	79	43.9	56	79	52.7	67	18	48-136/30	
135-98-8	sec-Butylbenzene	ND	79	11.8	15* a	79	15.3	19* a	26	23-151/34	
98-06-6	tert-Butylbenzene	ND	79	13.8	17* a	79	17.9	23* a	26	30-149/34	
110-82-7	Cyclohexane	ND	79	18.8	24	79	26.1	33	33	22-154/33	
107-06-2	1,2-Dichloroethane	ND	79	55.3	70	79	61.7	78	11	56-140/24	
100-41-4	Ethylbenzene	ND	79	24.4	31* a	79	31.7	40	26	34-145/29	
110-54-3	Hexane	ND	79	12.3	16	79	17.8	23	37* a	10-157/33	
98-82-8	Isopropylbenzene	ND	79	19.6	25* a	79	24.7	31* a	23	36-145/33	
1634-04-4	Methyl Tert Butyl Ether	ND	158	110	70	158	117	74	6	54-129/25	
91-20-3	Naphthalene	ND	79	11.4	14	79	11.8	15	3	12-160/33	
108-88-3	Toluene	ND	79	34.0	43	79	41.2	52	19	40-141/30	
95-63-6	1,2,4-Trimethylbenzene	ND	79	15.3	19* a	79	19.3	24	23	23-152/31	
108-67-8	1,3,5-Trimethylbenzene	ND	79	15.6	20* a	79	19.7	25* a	23	26-150/32	
1330-20-7	Xylene (total)	ND	237	71.5	30* a	237	90.9	38	24	34-146/29	

CAS No.	Surrogate Recoveries	MS	MSD	D75212-20	Limits
1868-53-7	Dibromofluoromethane	98%	91%	95%	70-122%
17060-07-0	1,2-Dichloroethane-D4	105%	97%	102%	68-124%
2037-26-5	Toluene-D8	99%	97%	97%	77-125%
460-00-4	4-Bromofluorobenzene	105%	102%	101%	72-130%

(a) Outside control limits due to matrix interference.

\* = Outside of Control Limits.

6.3.1  
6

# Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	V3C5608-BFB	Injection Date:	08/31/15
Lab File ID:	3C122763.D	Injection Time:	13:06
Instrument ID:	GCMS3C		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	10995	17.4	Pass
75	30.0 - 60.0% of mass 95	30778	48.6	Pass
95	Base peak, 100% relative abundance	63288	100.0	Pass
96	5.0 - 9.0% of mass 95	4205	6.64	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) <sup>a</sup> Pass
174	50.0 - 120.0% of mass 95	54304	85.8	Pass
175	5.0 - 9.0% of mass 174	3822	6.04	(7.04) <sup>a</sup> Pass
176	95.0 - 101.0% of mass 174	53450	84.5	(98.4) <sup>a</sup> Pass
177	5.0 - 9.0% of mass 176	3601	5.69	(6.74) <sup>b</sup> Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3C5608-IC5608	3C122764.D	08/31/15	13:38	00:32	Initial cal 0.2
V3C5608-IC5608	3C122765.D	08/31/15	14:06	01:00	Initial cal 0.5
V3C5608-IC5608	3C122766.D	08/31/15	14:33	01:27	Initial cal 1
V3C5608-IC5608	3C122767.D	08/31/15	15:01	01:55	Initial cal 2
V3C5608-IC5608	3C122768.D	08/31/15	15:29	02:23	Initial cal 4
V3C5608-IC5608	3C122769.D	08/31/15	15:57	02:51	Initial cal 8
V3C5608-IC5608	3C122770.D	08/31/15	16:25	03:19	Initial cal 20
V3C5608-ICC5608	3C122771.D	08/31/15	16:52	03:46	Initial cal 50
V3C5608-IC5608	3C122772.D	08/31/15	17:20	04:14	Initial cal 100
V3C5608-IC5608	3C122773.D	08/31/15	17:48	04:42	Initial cal 200
V3C5608-ICV5608	3C122776.D	08/31/15	19:11	06:05	Initial cal verification 50

# Instrument Performance Check (BFB)

Page 1 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	V3C5637-BFB	Injection Date:	09/21/15
Lab File ID:	3C123390.D	Injection Time:	13:43
Instrument ID:	GCMS3C		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	11156	18.9	Pass
75	30.0 - 60.0% of mass 95	29987	50.8	Pass
95	Base peak, 100% relative abundance	59003	100.0	Pass
96	5.0 - 9.0% of mass 95	3852	6.53	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) <sup>a</sup> Pass
174	50.0 - 120.0% of mass 95	50896	86.3	Pass
175	5.0 - 9.0% of mass 174	3985	6.75	(7.83) <sup>a</sup> Pass
176	95.0 - 101.0% of mass 174	51189	86.8	(100.6) <sup>a</sup> Pass
177	5.0 - 9.0% of mass 176	3140	5.32	(6.13) <sup>b</sup> Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3C5637-CC5608	3C123391.D	09/21/15	14:16	00:33	Continuing cal 20
V3C5637-CC5608	3C123392.D	09/21/15	14:44	01:01	Continuing cal 20
V3C5637-CC5608	3C123393.D	09/21/15	15:20	01:37	Continuing cal 10
V3C5637-CC5608	3C123394.D	09/21/15	15:48	02:05	Continuing cal 1
V3C5637-MB	3C123395.D	09/21/15	16:15	02:32	Method Blank
V3C5637-BS	3C123396.D	09/21/15	17:01	03:18	Blank Spike
D75212-20MS	3C123397.D	09/21/15	17:40	03:57	Matrix Spike
D75212-20MSD	3C123398.D	09/21/15	18:08	04:25	Matrix Spike Duplicate
D75212-20	3C123400.D	09/21/15	19:03	05:20	(used for QC only; not part of job JC4006)
ZZZZZZ	3C123401.D	09/21/15	19:30	05:47	(unrelated sample)
ZZZZZZ	3C123402.D	09/21/15	19:58	06:15	(unrelated sample)
ZZZZZZ	3C123403.D	09/21/15	20:26	06:43	(unrelated sample)
ZZZZZZ	3C123404.D	09/21/15	20:53	07:10	(unrelated sample)
ZZZZZZ	3C123405.D	09/21/15	21:21	07:38	(unrelated sample)
ZZZZZZ	3C123406.D	09/21/15	21:48	08:05	(unrelated sample)
ZZZZZZ	3C123407.D	09/21/15	22:16	08:33	(unrelated sample)
ZZZZZZ	3C123408.D	09/21/15	22:44	09:01	(unrelated sample)
JC4006-1	3C123409.D	09/21/15	23:11	09:28	MHIC-388-8(5.0)
JC4006-2	3C123410.D	09/21/15	23:39	09:56	MHIC-388-9(5.0)
JC4006-3	3C123411.D	09/22/15	00:06	10:23	MHIC-388-10(5.0)
JC4006-4	3C123412.D	09/22/15	00:34	10:51	MHIC-388-11(5.0)
V3C5638-CC4586	3C123418.D	09/22/15	12:16	22:33	Continuing cal 50
V3C5638-MB	3C123419.D	09/22/15	12:41	22:58	Method Blank
V3C5638-BS	3C123420.D	09/22/15	13:07	23:24	Blank Spike

## Instrument Performance Check (BFB)

Page 2 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	V3C5637-BFB	Injection Date:	09/21/15
Lab File ID:	3C123390.D	Injection Time:	13:43
Instrument ID:	GCMS3C		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
JC4258-1MS	3C123421.D	09/22/15	13:32	23:49	Matrix Spike
JC4258-1MSD	3C123422.D	09/22/15	13:58	24:15	Matrix Spike Duplicate
JC4258-1	3C123423.D	09/22/15	14:22	24:39	(used for QC only; not part of job JC4006)

# Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Check Std:	V3C5637-CC5608	Injection Date:	09/21/15
Lab File ID:	3C123391.D	Injection Time:	14:16
Instrument ID:	GCMS3C	Method:	SW846 8260C

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
Check Std	114910	7.08	241123	9.33	283399	10.24
Upper Limit <sup>a</sup>	229820	7.58	482246	9.83	566798	10.74
Lower Limit <sup>b</sup>	57455	6.58	120562	8.83	141700	9.74

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	
V3C5637-MB	89389	7.10	234057	9.33	267364	10.25
V3C5637-BS	103989	7.08	248712	9.33	295624	10.25
D75212-20MS	119949	7.09	280783	9.33	339463	10.25
D75212-20MSD	82639	7.09	250384	9.33	291455	10.25
D75212-20	103443	7.09	247753	9.33	289615	10.25
ZZZZZZ	101074	7.10	258180	9.33	302487	10.25
ZZZZZZ	119095	7.09	252556	9.33	301786	10.25
ZZZZZZ	98293	7.09	230825	9.33	273503	10.25
ZZZZZZ	86599	7.08	217822	9.33	257804	10.25
ZZZZZZ	105761	7.10	223876	9.33	265345	10.25
ZZZZZZ	100979	7.09	242862	9.33	282607	10.25
ZZZZZZ	97719	7.09	235611	9.33	279782	10.25
ZZZZZZ	129671	7.09	247596	9.33	292221	10.25
JC4006-1	107064	7.10	253715	9.33	296110	10.25
JC4006-2	86154	7.08	252863	9.33	302830	10.25
JC4006-3	97692	7.09	249886	9.33	296489	10.25
JC4006-4	104160	7.08	236918	9.33	278823	10.25

IS 1 = Tert Butyl Alcohol-D9

IS 2 = Pentafluorobenzene

IS 3 = 1,4-Difluorobenzene

IS 4 = Chlorobenzene-D5

IS 5 = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Method: SW846 8260C

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
JC4006-1	3C123409.D	94	97	99	97
JC4006-2	3C123410.D	94	98	97	97
JC4006-3	3C123411.D	94	99	98	98
JC4006-4	3C123412.D	95	99	100	95
D75212-20MS	3C123397.D	98	105	99	105
D75212-20MSD	3C123398.D	91	97	97	102
V3C5637-BS	3C123396.D	94	105	99	97
V3C5637-MB	3C123395.D	91	95	98	93

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Dibromofluoromethane	70-122%
S2 = 1,2-Dichloroethane-D4	68-124%
S3 = Toluene-D8	77-125%
S4 = 4-Bromofluorobenzene	72-130%

6.6.1  
6

**Initial Calibration Summary**

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample: V3C5608-ICC5608

Lab FileID: 3C122771.D

## Response Factor Report MS3C

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)

Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um

Last Update : Tue Sep 01 09:35:56 2015

Response via : Initial Calibration

## Calibration Files

8	=3C122769.D	4	=3C122768.D	0.5	=3C122765.D	50	=3C122771.D
100	=3C122772.D	1	=3C122766.D	200	=3C122773.D	20	=3C122770.D
2	=3C122767.D	0.2	=3C122764.D		=		=

## Compound

	8	4	0.5	50	100	1	200	20	2	0.2	Avg	%RSD
--	---	---	-----	----	-----	---	-----	----	---	-----	-----	------

-----

1) I	Tert Butyl Alcohol-d9	-----ISTD-----									
2)	1,4-dioxane	0.104 0.109 0.093 0.103 0.102 0.103 0.091 0.101 6.14									
3)	tertiary butyl alcohol	1.291 1.142 1.198 1.215 1.140 1.254 1.332 1.225 5.92									
4)	ethanol	0.000 -1.00									
5) I	pentafluorobenzene	-----ISTD-----									
6)	propene	0.000 -1.00									
7)	chlorodifluoromethane	0.933 0.700 0.768 0.758 0.723 0.787 0.701 0.767 10.50									
8)	dichlorodifluoromethane	1.271 1.088 1.267 1.160 1.115 1.067 1.040 1.171 0.996 1.040 1.121 8.46									
9)	chloromethane	0.745 0.668 0.689 0.720 0.813 0.723 0.689 0.703 0.719 6.27									
10)	vinyl chloride	0.755 0.666 0.857 0.738 0.771 0.688 0.761 0.732 0.680 0.720 0.737 7.49									
11)	bromomethane	0.457 0.422 0.594 0.403 0.416 0.415 0.409 0.418 0.395 0.538 0.447 14.80									
12)	chloroethane	0.356 0.335 0.370 0.332 0.337 0.385 0.325 0.341 0.350 0.348 5.67									
13)	1,3-butadiene	0.000 -1.00									
14)	Vinyl Bromide	0.000 -1.00									
15)	Pentane	0.000 -1.00									
16)	trichlorofluoromethane	0.935 0.816 0.914 0.831 0.824 0.841 0.792 0.862 0.759 0.841 6.60									
17)	ethyl ether	0.223 0.195 0.204 0.212 0.232 0.208 0.210 0.249 0.217 7.95									
18)	acrolein	0.065 0.068 0.064 0.065 0.063 0.068 0.066 0.068 0.066 3.13									
19)	1,1-dichloroethene	0.722 0.626 0.662 0.671 0.676 0.708 0.653 0.711 0.659 0.592 0.668 5.96									
20)	acetone	0.130 0.125 0.115 0.136 0.127 0.176 0.135 15.84									
21)	allyl chloride	0.269 0.237 0.238 0.232 0.220 0.226 0.245 0.221 0.236 6.65									
22)	acetonitrile	0.036 0.032 0.031 0.030 0.036 0.033 7.86									
23)	iodomethane	0.000 -1.00									

6.7.1  
6

**Initial Calibration Summary**

Job Number: JC4006

Sample: V3C5608-ICC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C122771.D

Project: Sunoco - Marcus Hook Facility, PA

24)	iso-butyl alcohol	0.805 0.690 0.812 0.753 0.759 0.774 0.741 0.767 0.719 0.013 0.015 0.013 0.013 0.014 0.012	0.758	5.09
25)	carbon disulfide	1.837 1.541 1.894 1.673 1.677 1.834 1.623 1.772 1.612 1.947 1.741 7.75		
26)	methylene chloride	0.496 0.463 0.458 0.455 0.440 0.478 0.504 0.256 0.180 0.247 0.246 0.245 0.264	0.471	4.91
27)	methyl acetate	1.429 1.248 1.526 1.387 1.386 1.506 1.356 1.397 1.344 1.781 1.436 10.07	0.240	12.59
28)	methyl tert butyl ether	1.429 1.248 1.526 1.387 1.386 1.506 1.356 1.397 1.344 1.781 1.436 10.07		
29)	trans-1,2-dichloroethene	0.686 0.588 0.633 0.639 0.652 0.704 0.626 0.674 0.607 0.684 0.649 5.76		
30)	di-isopropyl ether	1.629 1.426 1.990 1.557 1.594 1.520 1.575 1.579 1.474 1.608 1.595 9.55		
31)	ethyl tert-butyl ether	1.557 1.310 1.711 1.541 1.546 1.493 1.556 1.517 1.421 1.485 1.514 6.81		
32)	2-butanone	0.031 0.041 0.046 0.044 0.049 0.042 16.44		
33)	1,1-dichloroethane	0.859 0.738 0.890 0.791 0.813 0.815 0.784 0.824 0.719 0.996 0.823 9.61		
34)	chloroprene	0.651 0.599 0.686 0.625 0.641 0.694 0.630 0.671 0.582 0.534 0.631 7.80		
35)	acrylonitrile	0.121 0.097 0.068 0.115 0.113 0.082 0.111 0.118 0.096 0.102 17.63		
36)	vinyl acetate	**This compound does not meet Initial Calibration criteria 0.028 0.051 0.053 0.051 0.054 0.047 23.06		
		----- Linear regression ----- Coefficient = 0.9989 Response Ratio = -0.00070 + 0.05164 *A		
37)	ethyl acetate	0.040 0.033 0.046 0.045 0.042 0.040 0.041 10.97		
38)	2,2-dichloropropane	0.905 0.769 0.979 0.879 0.890 0.965 0.857 0.911 0.857 0.906 0.892 6.62		
39)	cis-1,2-dichloroethene	0.513 0.446 0.469 0.482 0.619 0.470 0.499 0.467 0.496 10.92		
40)	propionitrile	0.044 0.034 0.044 0.045 0.044 0.045 0.033 0.041 12.92		
41)	Methyl Acrylate	0.025 0.039 0.040 0.041 0.037 0.037 17.51		
42)	bromochloromethane	0.208 0.180 0.203 0.205 0.225 0.201 0.210 0.203 0.205 6.08		
43)	tetrahydrofuran	0.046 0.035 0.044 0.043 0.042 0.046 0.043 9.60		
44)	chloroform	0.793 0.683 0.782 0.726 0.743 0.849 0.735 0.747 0.668 0.862 0.759 8.38		
45)	tert-Butyl Formate	0.364 0.326 0.397 0.391 0.382 0.396 0.373 0.390 0.346 0.374 6.52		
46)	dibromofluoromethane (s)	0.383 0.376 0.381 0.379 0.377 0.371 0.379 0.385 0.382 0.385 0.380 1.17		
47)	1,2-dichloroethane-d4 (s)	0.366 0.368 0.362 0.355 0.351 0.360 0.345 0.376 0.360 0.364 0.361 2.49		
48)	freon 113	0.432 0.375 0.521 0.391 0.389 0.385 0.370 0.404 0.381 0.405 11.57		
49)	methacrylonitrile	0.117 0.103 0.116 0.118 0.117 0.114 0.114 4.88		
50)	1,1,1-trichloroethane	0.869 0.740 0.843 0.817 0.837 0.881 0.807 0.861 0.769 0.948 0.837 7.03		
51)	Cyclohexane	0.901 0.808 1.015 0.872 0.896 0.962 0.871 0.906 0.839 0.978 0.905 7.05		

6.7.1  
6

**Initial Calibration Summary**

Job Number: JC4006

Sample: V3C5608-ICC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C122771.D

Project: Sunoco - Marcus Hook Facility, PA

52)	Tert Amyl Alcohol		0.000	-1.00
53)	2,2,4-trimethylpentane			
	1.873 1.610 2.227 1.958 1.944 1.796 2.009 1.927 1.675 1.775 1.879 9.43			
54)	tert-amyl methyl ether			
	1.446 1.246 1.402 1.391 1.421 1.407 1.385 1.430 1.391 4.44			
55)	I 1,4-difluorobenzene	-----ISTD-----		
56)	epichlorohydrin			
	0.026 0.026 0.025 0.025 0.023 0.024 0.027 0.020 0.024 9.14			
57)	n-butyl alcohol			
	0.009 0.008 0.009 0.009 0.009 0.010 0.006 0.009 14.29			
58)	carbon tetrachloride			
	0.611 0.521 0.658 0.568 0.577 0.615 0.552 0.591 0.587 0.782 0.606 11.89			
59)	1,1-dichloropropene			
	0.487 0.406 0.451 0.460 0.545 0.444 0.471 0.445 0.464 8.73			
60)	hexane			
	0.488 0.440 0.439 0.437 0.656 0.419 0.463 0.488 0.479 15.81			
61)	benzene			
	1.478 1.300 1.667 1.370 1.375 1.579 1.357 1.428 1.265 1.744 1.456 10.94			
62)	heptane			
	0.291 0.250 0.282 0.273 0.297 0.263 0.290 0.273 0.277 5.65			
63)	isopropyl acetate			
	0.052 0.049 0.054 0.055 0.056 0.056 0.054 5.30			
64)	1,2-dichloroethane			
	0.396 0.359 0.374 0.364 0.362 0.414 0.351 0.375 0.357 0.464 0.381 9.11			
65)	trichloroethylene			
	0.338 0.286 0.340 0.329 0.334 0.361 0.329 0.339 0.300 0.329 6.88			
66)	ethyl acrylate			
	0.000 -1.00			
67)	Tert-Amyl ethyl ether		0.000	-1.00
68)	2-nitropropane			
	0.104 0.093 0.081 0.078 0.074 0.085 0.095 0.087 12.09			
69)	2-chloroethyl vinyl ether			
	0.141 0.120 0.142 0.140 0.136 0.137 0.133 0.138 0.119 0.141 0.135 6.16			
70)	methyl methacrylate			
	0.055 0.044 0.061 0.063 0.063 0.059 0.057 12.55			
71)	1,2-dichloropropane			
	0.345 0.309 0.376 0.334 0.340 0.374 0.337 0.339 0.321 0.342 6.44			
72)	methylcyclohexane			
	0.757 0.650 0.951 0.720 0.729 0.739 0.714 0.731 0.691 0.701 0.738 10.89			
73)	dibromomethane			
	0.165 0.148 0.163 0.160 0.161 0.157 0.168 0.140 0.158 5.92			
74)	bromodichloromethane			
	0.432 0.358 0.491 0.418 0.419 0.404 0.415 0.410 0.359 0.412 9.63			
75)	cis-1,3-dichloropropene			
	0.488 0.430 0.519 0.496 0.498 0.501 0.488 0.486 0.439 0.557 0.490 7.39			
76)	toluene-d8 (s)			
	1.172 1.171 1.156 1.198 1.202 1.163 1.192 1.174 1.167 1.151 1.175 1.49			
77)	4-methyl-2-pentanone			
	0.104 0.080 0.102 0.099 0.097 0.098 0.086 0.095 9.25			
78)	toluene			
	1.392 1.224 1.485 1.336 1.364 1.490 1.317 1.365 1.247 1.721 1.394 10.32			
79)	3-methyl-1-butanol			
	0.009 0.007 0.009 0.009 0.009 0.009 0.006 0.008 12.97			
80)	trans-1,3-dichloropropene			
	0.434 0.385 0.492 0.424 0.424 0.464 0.407 0.420 0.389 0.422 0.426 7.57			
81)	ethyl methacrylate			
	0.306 0.252 0.317 0.321 0.290 0.317 0.309 0.248 0.295 9.90			

6.7.1  
6

**Initial Calibration Summary**

Job Number: JC4006

Sample: V3C5608-ICC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C122771.D

Project: Sunoco - Marcus Hook Facility, PA

82)	1,1,2-trichloroethane	0.221 0.207 0.228 0.223 0.222 0.243 0.217 0.227 0.205	0.222	5.18
83)	2-hexanone	0.064 0.051 0.086 0.090 0.090 0.092	0.079	21.50
		----- Linear regression ----- Coefficient = 0.9998		
		Response Ratio = -0.00242 + 0.09045 *A		
84)	I chlorobenzene-d5	-----ISTD-----		
85)	tetrachloroethene	0.542 0.386 0.454 0.422 0.476 0.506 0.492 0.472 0.463	0.468	9.75
86)	1,3-dichloropropane	0.516 0.431 0.498 0.473 0.472 0.500 0.464 0.488 0.441 0.616 0.490	0.490	10.52
87)	butyl acetate	0.194 0.170 0.183 0.183 0.182 0.188	0.183	4.37
88)	dibromochloromethane	0.361 0.305 0.412 0.349 0.347 0.380 0.346 0.356 0.284	0.349	10.77
89)	1,2-dibromoethane	0.282 0.233 0.275 0.266 0.265 0.291 0.264 0.273 0.263	0.268	6.01
90)	3,3-Dimethyl-1-Butanol	0.039 0.032 0.041 0.040 0.042 0.041 0.035	0.038	9.61
91)	chlorobenzene	1.079 0.915 1.085 0.992 0.999 1.125 0.977 1.025 0.990 1.245 1.043	1.043	8.99
92)	1,1,1,2-tetrachloroethane	0.448 0.363 0.476 0.427 0.452 0.471 0.453 0.448 0.390	0.437	8.53
93)	ethylbenzene	1.844 1.601 1.893 1.847 1.852 2.018 1.818 1.894 1.648 2.200 1.861	1.861	9.09
94)	m,p-xylene	0.707 0.586 0.685 0.694 0.702 0.759 0.691 0.721 0.610 0.780 0.693	0.693	8.51
95)	o-xylene	1.573 1.315 1.514 1.552 1.575 1.688 1.543 1.583 1.336 1.693 1.537	1.537	8.18
96)	styrene	1.072 0.895 1.062 1.124 1.122 1.073 1.111 1.108 0.879 1.131 1.058	1.058	8.79
97)	butyl acrylate		0.000	-1.00
98)	n-butyl ether	1.743 1.518 2.024 1.709 1.762 1.820 1.736 1.736 1.572 1.969 1.759	1.759	8.80
99)	bromoform	0.239 0.188 0.234 0.230 0.239 0.231 0.239 0.191	0.224	9.65
100)	I 1,4-dichlorobenzene-d	-----ISTD-----		
101)	isopropylbenzene	3.628 3.124 3.633 3.538 3.789 3.772 3.640 3.800 3.280 4.013 3.622	3.622	7.17
102)	4-bromofluorobenzene (s)	0.949 0.962 0.931 0.941 0.942 0.945 0.915 0.959 0.934 0.948 0.943	0.943	1.45
103)	bromobenzene	0.817 0.730 0.900 0.807 0.815 0.946 0.803 0.857 0.740	0.824	8.40
104)	cis-1,4-dichloro-2-butene		0.000	-1.00
105)	cyclohexanone **This compound does not meet Initial Calibration criteria	0.102 0.048 0.139 0.156 0.145 0.179	0.128	36.41
		----- Linear regression ----- Coefficient = 0.9970		
		Response Ratio = 0.00014 + 0.14715 *A		
106)	1,1,2,2-tetrachloroethane	0.726 0.661 0.790 0.689 0.698 0.828 0.679 0.744 0.667	0.720	7.99
107)	trans-1,4-dichloro-2-butene	0.188 0.175 0.193 0.180 0.233 0.179 0.204 0.203	0.195	9.69
108)	1,2,3-trichloropropane	0.200 0.180 0.186 0.185 0.202 0.180 0.206 0.178	0.190	5.97

**Initial Calibration Summary**

Job Number: JC4006

Sample: V3C5608-ICC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C122771.D

Project: Sunoco - Marcus Hook Facility, PA

109)	n-propylbenzene	4.132 3.540 4.362 3.881 3.964 4.271 3.774 4.129 3.669 4.872 4.059	9.55
110)	4-Ethyltoluene		0.000 -1.00
111)	2-chlorotoluene	0.839 0.736 0.829 0.794 0.837 0.851 0.820 0.849 0.780 0.973 0.831	7.42
112)	4-chlorotoluene	0.851 0.740 0.882 0.805 0.823 0.925 0.795 0.834 0.755 0.946 0.836	8.08
113)	1,3,5-trimethylbenzene	3.127 2.751 3.512 3.036 3.198 3.279 3.123 3.253 2.771 3.599 3.165	8.67
114)	tert-butylbenzene	2.547 3.059 2.667 2.581 2.773 2.675 2.768 2.736 2.293 2.786 2.688	7.35
115)	pentachloroethane	0.395 0.475 0.587 0.589 0.556 0.500 0.521 0.571 0.433	0.514 13.52
116)	1,2,4-trimethylbenzene	3.012 2.717 3.263 2.957 3.067 3.019 2.945 3.114 2.655 3.700 3.045	9.55
117)	sec-butylbenzene	4.249 3.764 4.177 4.109 4.321 4.643 4.174 4.442 3.674 4.563 4.212	7.42
118)	1,3-dichlorobenzene	1.702 1.588 1.938 1.688 1.696 1.966 1.673 1.755 1.610 1.889 1.750	7.67
119)	p-isopropyltoluene	3.533 3.153 3.643 3.437 3.572 3.637 3.432 3.732 3.227 4.245 3.561	8.48
120)	1,4-dichlorobenzene	1.749 1.607 1.905 1.700 1.697 1.939 1.681 1.762 1.542 2.114 1.770	9.64
121)	1,2-dichlorobenzene	1.738 1.547 1.903 1.663 1.662 1.849 1.631 1.734 1.552 2.140 1.742	10.40
122)	1,4-Diethylbenzene		0.000 -1.00
123)	n-butylbenzene	1.830 1.609 1.815 1.802	1.731 1.911 1.673 1.767 5.81
124)	1,2,4,5-Tetramethylbenzene		0.000 -1.00
125)	1,2-dibromo-3-chloropropane	0.172 0.167 0.179 0.178 0.223 0.185 0.185 0.158	0.181 10.70
126)	1,3,5-Trichlorobenzene	1.621 1.474 1.834 1.700 1.690 1.794 1.709 1.711 1.539 1.891 1.696	7.54
127)	1,2,4-trichlorobenzene	1.487 1.246 1.587 1.577 1.592 1.543 1.622 1.587 1.267 1.701 1.521	9.84
128)	hexachlorobutadiene	0.944 0.884 0.997 0.898 0.884 1.079 0.880 0.956 0.831 1.158 0.951	10.66
129)	naphthalene	3.035 2.477 3.010 3.200 3.197 2.619 3.236 3.212 2.458 3.248 2.969	10.91
130)	1,2,3-trichlorobenzene	1.512 1.232 1.440 1.578 1.589 1.466 1.578 1.586 1.348 1.611 1.494	8.32
131)	hexachloroethane	0.622 0.522 0.624 0.678 0.669 0.701 0.660 0.560	0.630 9.76
132)	Benzyl chloride	1.566 1.459 1.728 1.704 1.635 1.690 1.801 1.523	1.638 7.00

-----  
(#) = Out of Range   ### Number of calibration levels exceeded format   ###

M3C5608.M               Tue Sep 01 13:35:15 2015   MS3C

6.7.1  
6

**Initial Calibration Verification**

Job Number: JC4006

Sample: V3C5608-ICV5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C122776.D

**Evaluate Continuing Calibration Report**

Data File : C:\MSDCHEM\1\DATA\3C122776.D Vial: 14  
 Acq On : 31 Aug 2015 7:11 pm Operator: PrashanS  
 Sample : ICV5608-50 Inst : MS3C  
 Misc : MS90124,V3C5608,5.0,,,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)  
 Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 Last Update : Tue Sep 01 13:33:40 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	108	0.00	7.09
2	1,4-dioxane	0.101	0.098	3.0	114	0.00	10.97
3	tertiary butyl alcohol	1.225	1.260	-2.9	113	0.01	7.21
4	ethanol			-----NA-----			
5	I pentafluorobenzene	1.000	1.000	0.0	107	0.00	9.34
6	propene			-----NA-----			
7	chlorodifluoromethane	0.767	0.644	16.0	90	0.00	3.79
8	dichlorodifluoromethane	1.121	1.089	2.9	100	0.00	3.80
9	chloromethane	0.719	0.681	5.3	105	0.00	4.10
10	vinyl chloride	0.737	0.723	1.9	105	0.00	4.34
11	bromomethane	0.447	0.409	8.5	108	0.00	4.98
12	chloroethane	0.348	0.328	5.7	106	0.00	5.14
13	1,3-butadiene			-----NA-----			
14	Vinyl Bromide			-----NA-----			
15	Pentane			-----NA-----			
16	trichlorofluoromethane	0.841	0.800	4.9	103	0.00	5.60
17	ethyl ether	0.217	0.218	-0.5	114	0.00	6.01
18	acrolein	0.066	0.062	6.1	104	0.00	6.24
19	1,1-dichloroethene	0.668	0.658	1.5	105	0.00	6.42
20	acetone	0.135	0.121	10.4	113	0.00	6.47
21	allyl chloride	0.236	0.231	2.1	104	0.00	6.94
22	acetonitrile	0.033	0.034	-3.0	114	0.00	6.88
23	iodomethane	0.758	0.747	1.5	106	0.00	6.69
24	iso-butyl alcohol	0.013	0.013	0.0	104	0.00	9.62
25	carbon disulfide	1.741	1.631	6.3	104	0.00	6.82
26	methylene chloride	0.471	0.464	1.5	108	0.00	7.13
27	methyl acetate	0.240	0.216	10.0	93	0.00	6.94
28	methyl tert butyl ether	1.436	1.352	5.8	104	0.00	7.47
29	trans-1,2-dichloroethene	0.649	0.637	1.8	106	0.00	7.51
30	di-isopropyl ether	1.595	1.553	2.6	107	0.00	8.06
31	ethyl tert-butyl ether	1.514	1.474	2.6	102	0.00	8.53
32	2-butanone	0.042	0.042	0.0	109	0.00	8.79
33	1,1-dichloroethane	0.823	0.793	3.6	107	0.00	8.07
34	chloroprene	0.631	0.576	8.7	98	0.00	8.19
35	acrylonitrile	0.102	0.121	-18.6	112	0.00	7.45
36	vinyl acetate	50.000	61.543	True	Calc.	% Drift	-----
37	ethyl acetate	0.041	0.046	-----	AvgRF	CCRF	% Dev

**Initial Calibration Verification**

Job Number: JC4006

Sample: V3C5608-ICV5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C122776.D

38	2,2-dichloropropane	0.892	0.824	7.6	100	0.00	8.81
39	cis-1,2-dichloroethene	0.496	0.469	5.4	107	0.00	8.81
40	propionitrile	0.041	0.047	-14.6	113	0.00	8.87
41	Methyl Acrylate	0.037	0.041	-10.8	110	0.01	8.89
42	bromochloromethane	0.205	0.208	-1.5	110	0.00	9.12
43	tetrahydrofuran	0.043	0.044	-2.3	106	0.00	9.17
44	chloroform	0.759	0.728	4.1	107	0.00	9.18
45	tert-Butyl Formate	0.374	0.355	5.1	97	0.00	9.21
46 S	dibromofluoromethane (s)	0.380	0.376	1.1	106	0.00	9.38
47 S	1,2-dichloroethane-d4 (s)	0.361	0.348	3.6	105	0.00	9.80
48	freon 113	0.405	0.373	7.9	102	0.00	6.39
49	methacrylonitrile	0.114	0.121	-6.1	111	0.00	9.06
50	1,1,1-trichloroethane	0.837	0.784	6.3	102	0.00	9.44
51	Cyclohexane	0.905	0.855	5.5	105	0.00	9.52
52	Tert Amyl Alcohol			-----NA-----			
53	2,2,4-trimethylpentane	1.879	1.663	11.5	91	0.00	9.89
54	tert-amyl methyl ether	1.391	1.366	1.8	104	0.00	9.91
55 I	1,4-difluorobenzene	1.000	1.000	0.0	108	0.00	10.25
56	epichlorohydrin	0.024	0.025	-4.2	109	0.00	11.52
57	n-butyl alcohol	0.009	0.010	-11.1	117	0.00	10.38
58	carbon tetrachloride	0.606	0.539	11.1	102	0.00	9.64
59	1,1-dichloropropene	0.464	0.444	4.3	106	0.00	9.61
60	hexane	0.479	0.421	12.1	103	0.00	7.83
61	benzene	1.456	1.358	6.7	107	0.00	9.88
62	heptane	0.277	0.238	14.1	91	0.00	10.06
63	isopropyl acetate	0.054	0.056	-3.7	111	0.00	9.80
64	1,2-dichloroethane	0.381	0.360	5.5	107	0.00	9.89
65	trichloroethene	0.329	0.322	2.1	106	0.00	10.60
66	ethyl acrylate			-----NA-----			
67	Tert-Amyl ethyl ether			-----NA-----			
68	2-nitropropane	0.087	0.080	8.0	106	0.00	11.37
69	2-chloroethyl vinyl ether	0.135	0.150	-11.1	116	0.00	11.39
70	methyl methacrylate	0.057	0.064	-12.3	113	0.00	10.88
71	1,2-dichloropropane	0.342	0.333	2.6	107	0.00	10.86
72	methylcyclohexane	0.738	0.632	14.4	95	0.00	10.82
73	dibromomethane	0.158	0.163	-3.2	108	0.00	11.02
74	bromodichloromethane	0.412	0.409	0.7	105	0.00	11.15
75	cis-1,3-dichloropropene	0.490	0.492	-0.4	107	0.00	11.61
76 S	toluene-d8 (s)	1.175	1.186	-0.9	107	0.00	11.91
77	4-methyl-2-pentanone	0.095	0.101	-6.3	107	0.00	11.71
78	toluene	1.394	1.338	4.0	108	0.00	11.98
79	3-methyl-1-butanol	0.008	0.009	-12.5	112	0.00	11.73
80	trans-1,3-dichloropropene	0.426	0.428	-0.5	109	0.00	12.17
81	ethyl methacrylate	0.295	0.323	-9.5	110	0.00	12.17
82	1,1,2-trichloroethane	0.222	0.231	-4.1	111	0.00	12.39
83	2-hexanone	50.000	49.416	True Calc. AvgRF CCRF	% Drift 1.2 109	0.00	12.56
84 I	chlorobenzene-d5	1.000	1.000	0.0	107	0.00	13.41
85	tetrachloroethene	0.468	0.482	-3.0	122	0.00	12.57
86	1,3-dichloropropane	0.490	0.483	1.4	109	0.00	12.56
87	butyl acetate	0.183	0.193	-5.5	113	0.00	12.64
88	dibromochloromethane	0.349	0.345	1.1	106	0.00	12.83
89	1,2-dibromoethane	0.268	0.270	-0.7	109	0.00	12.98
90	3,3-Dimethyl-1-Butanol	0.038	0.043	-13.2	113	0.00	12.73
91	chlorobenzene	1.043	0.992	4.9	107	0.00	13.44

**Initial Calibration Verification**

Job Number: JC4006

Sample: V3C5608-ICV5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C122776.D

92	1,1,1,2-tetrachloroethane	0.437	0.425	2.7	106	0.00	13.50
93	ethylbenzene	1.861	1.812	2.6	105	0.00	13.50
94	m,p-xylene	0.693	0.687	0.9	106	0.00	13.61
95	o-xylene	1.537	1.509	1.8	104	0.00	14.02
96	styrene	1.058	1.108	-4.7	106	0.00	14.03
97	butyl acrylate			-----NA-----			
98	n-butyl ether	1.759	1.744	0.9	109	0.00	13.37
99	bromoform	0.224	0.228	-1.8	104	0.00	14.29
100 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	102	0.00	15.71
101	isopropylbenzene	3.622	3.638	-0.4	105	0.00	14.36
102 S	4-bromofluorobenzene (s)	0.943	0.959	-1.7	104	0.00	14.56
103	bromobenzene	0.824	0.815	1.1	103	0.00	14.75
104	cis-1,4-dichloro-2-butene			-----NA-----			
		-----True-----	-----Calc.-----	-----% Drift-----			
105	cyclohexanone	500.000	518.877	-3.8	111	0.00	14.51
		-----AvgRF-----	-----CCRF-----	-----% Dev-----			
106	1,1,2,2-tetrachloroethane	0.720	0.712	1.1	105	0.00	14.66
107	trans-1,4-dichloro-2-bute	0.195	0.194	0.5	102	0.00	14.69
108	1,2,3-trichloropropane	0.190	0.191	-0.5	104	0.00	14.72
109	n-propylbenzene	4.059	3.910	3.7	102	0.00	14.76
110	4-Ethyltoluene			-----NA-----			
111	2-chlorotoluene	0.831	0.813	2.2	104	0.00	14.91
112	4-chlorotoluene	0.836	0.837	-0.1	106	0.00	15.00
113	1,3,5-trimethylbenzene	3.165	3.082	2.6	103	0.00	14.91
114	tert-butylbenzene	2.688	2.665	0.9	105	0.00	15.26
115	pentachloroethane	0.514	0.482	6.2	83	0.00	15.34
116	1,2,4-trimethylbenzene	3.045	2.968	2.5	102	0.00	15.30
117	sec-butylbenzene	4.212	4.155	1.4	103	0.00	15.47
118	1,3-dichlorobenzene	1.750	1.696	3.1	102	0.00	15.66
119	p-isopropyltoluene	3.561	3.468	2.6	103	0.00	15.59
120	1,4-dichlorobenzene	1.770	1.709	3.4	102	0.00	15.73
121	1,2-dichlorobenzene	1.742	1.673	4.0	102	0.00	16.12
122	1,4-Diethylbenzene			-----NA-----			
123	n-butylbenzene	1.767	1.777	-0.6	100	0.00	16.00
124	1,2,4,5-Tetramethylbenzen			-----NA-----			
125	1,2-dibromo-3-chloropropa	0.181	0.182	-0.6	103	0.00	16.88
126	1,3,5-Trichlorobenzene	1.696	1.661	2.1	99	0.00	17.08
127	1,2,4-trichlorobenzene	1.521	1.580	-3.9	102	0.00	17.71
128	hexachlorobutadiene	0.951	0.920	3.3	104	0.00	17.83
129	naphthalene	2.969	3.358	-13.1	107	0.00	17.97
130	1,2,3-trichlorobenzene	1.494	1.597	-6.9	103	0.00	18.22
131	hexachloroethane	0.630	0.642	-1.9	105	0.00	16.38
132	Benzyl chloride	1.638	1.600	2.3	94	0.00	15.85
		-----	-----	-----			

(#= Out of Range  
3C122771.D M3C5608.MSPCC's out = 0 CCC's out = 0  
Tue Sep 01 13:38:10 2015 MS3C

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C123391.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\3C\V3C5637\3C123391.D Vial: 2  
 Acq On : 21 Sep 2015 2:16 pm Operator: PrashanS  
 Sample : CC5608-20 Inst : MS3C  
 Misc : MS91451,V3C5637,5.0,,,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)  
 Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 Last Update : Mon Sep 13 11:48:20 2010  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	98	-0.01	7.08
2	1,4-dioxane	0.101	0.102	-1.0	97	0.00	10.99
3	tertiary butyl alcohol	1.225	1.268	-3.5	99	0.00	7.20
4	ethanol			-----NA-----			
5	I pentafluorobenzene	1.000	1.000	0.0	95	-0.01	9.33
6	propene			-----NA-----			
7	chlorodifluoromethane	0.767	0.825	-7.6	100	0.00	3.78
8	dichlorodifluoromethane	1.121	1.076	4.0	88	-0.02	3.78
9	chloromethane	0.719	0.564	21.6#	78	-0.01	4.09
10	vinyl chloride	0.737	0.614	16.7	80	-0.02	4.33
11	bromomethane	0.447	0.396	11.4	90	-0.01	4.97
12	chloroethane	0.348	0.311	10.6	87	0.00	5.14
13	1,3-butadiene			-----NA-----			
14	Vinyl Bromide			-----NA-----			
15	Pentane			-----NA-----			
16	trichlorofluoromethane	0.841	0.829	1.4	92	0.00	5.59
17	ethyl ether	0.217	0.203	6.5	92	-0.01	6.00
18	acrolein	0.066	0.060	9.1	91	0.00	6.24
19	1,1-dichloroethene	0.668	0.637	4.6	85	-0.01	6.41
20	acetone	0.135	0.118	12.6	64	0.00	6.47
21	allyl chloride	0.236	0.224	5.1	87	0.00	6.94
22	acetonitrile	0.033	0.034	-3.0	92	0.02	6.91
23	iodomethane	0.758	0.727	4.1	90	-0.01	6.68
24	iso-butyl alcohol	0.013	0.012	7.7	80	0.00	9.62
25	carbon disulfide	1.741	1.554	10.7	84	-0.01	6.82
26	methylene chloride	0.471	0.444	5.7	89	-0.01	7.12
27	methyl acetate	0.240	0.254	-5.8	92	0.00	6.94
28	methyl tert butyl ether	1.436	1.390	3.2	95	0.00	7.46
29	trans-1,2-dichloroethene	0.649	0.611	5.9	86	-0.01	7.50
30	di-isopropyl ether	1.595	1.463	8.3	88	0.00	8.06
31	ethyl tert-butyl ether	1.514	1.389	8.3	87	0.00	8.53
32	2-butanone	0.042	0.033	21.4#	63	0.00	8.80
33	1,1-dichloroethane	0.823	0.736	10.6	85	0.00	8.07
34	chloroprene	0.631	0.595	5.7	85	-0.01	8.18
35	acrylonitrile	0.102	0.114	-11.8	92	0.00	7.44
36	vinyl acetate	20.000	16.426	True	Calc.	% Drift	-----
37	ethyl acetate	0.041	0.039	AvgRF	CCRF	% Dev	-----
							8.08
							8.80

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123391.D

38	2,2-dichloropropane	0.892	0.845	5.3	89	-0.01	8.80
39	cis-1,2-dichloroethene	0.496	0.428	13.7	82	-0.01	8.80
40	propionitrile	0.041	0.045	-9.8	95	0.00	8.86
41	Methyl Acrylate	0.037	0.034	8.1	87	0.00	8.89
42	bromochloromethane	0.205	0.195	4.9	89	-0.01	9.11
43	tetrahydrofuran	0.043	0.039	9.3	81	-0.01	9.16
44	chloroform	0.759	0.689	9.2	88	-0.01	9.17
45	tert-Butyl Formate	0.374	0.364	2.7	89	-0.02	9.20
46 S	dibromofluoromethane (s)	0.380	0.357	6.1	88	-0.02	9.36
47 S	1,2-dichloroethane-d4 (s)	0.361	0.370	-2.5	94	-0.01	9.79
48	freon 113	0.405	0.398	1.7	94	-0.01	6.38
49	methacrylonitrile	0.114	0.103	9.6	86	0.00	9.06
50	1,1,1-trichloroethane	0.837	0.829	1.0	92	0.00	9.43
51	Cyclohexane	0.905	0.823	9.1	87	0.00	9.51
52	Tert Amyl Alcohol			-----NA-----			
53	2,2,4-trimethylpentane	1.879	1.621	13.7	80	-0.01	9.88
54	tert-amyl methyl ether	1.391	1.335	4.0	92	0.00	9.91
55 I	1,4-difluorobenzene	1.000	1.000	0.0	89	-0.01	10.24
56	epichlorohydrin	0.024	0.026	-8.3	85	0.00	11.51
57	n-butyl alcohol	0.009	0.010	-11.1	91	0.00	10.38
58	carbon tetrachloride	0.606	0.619	-2.1	93	-0.01	9.64
59	1,1-dichloropropene	0.464	0.444	4.3	84	0.00	9.61
60	hexane	0.479	0.411	14.2	79	-0.01	7.82
61	benzene	1.456	1.317	9.5	82	0.00	9.87
62	heptane	0.277	0.260	6.1	80	-0.01	10.05
63	isopropyl acetate	0.054	0.059	-9.3	93	0.00	9.81
64	1,2-dichloroethane	0.381	0.392	-2.9	93	0.00	9.88
65	trichloroethene	0.329	0.315	4.3	83	-0.01	10.59
66	ethyl acrylate			-----NA-----			
67	Tert-Amyl ethyl ether			-----NA-----			
68	2-nitropropane	0.087	0.094	-8.0	98	0.00	11.36
69	2-chloroethyl vinyl ether	0.135	0.141	-4.4	91	0.00	11.39
70	methyl methacrylate	0.057	0.059	-3.5	88	0.00	10.87
71	1,2-dichloropropane	0.342	0.321	6.1	84	0.00	10.85
72	methylcyclohexane	0.738	0.698	5.4	85	0.00	10.82
73	dibromomethane	0.158	0.167	-5.7	88	0.00	11.02
74	bromodichloromethane	0.412	0.402	2.4	88	0.00	11.15
75	cis-1,3-dichloropropene	0.490	0.485	1.0	89	0.00	11.61
76 S	toluene-d8 (s)	1.175	1.165	0.9	88	0.00	11.90
77	4-methyl-2-pentanone	0.095	0.106	-11.6	96	0.00	11.70
78	toluene	1.394	1.332	4.4	87	0.00	11.97
79	3-methyl-1-butanol	0.008	0.010	-25.0#	100	0.00	11.73
80	trans-1,3-dichloropropene	0.426	0.433	-1.6	92	0.00	12.17
81	ethyl methacrylate	0.295	0.308	-4.4	89	0.00	12.17
82	1,1,2-trichloroethane	0.222	0.228	-2.7	89	0.00	12.38
83	2-hexanone	20.000	18.990	True Calc.	% Drift		
				5.1	78	0.00	12.56
84 I	chlorobenzene-d5	1.000	1.000	AvgRF CCRF	% Dev		
85	tetrachloroethene	0.468	0.448	4.3	84	0.00	12.56
86	1,3-dichloropropane	0.490	0.508	-3.7	92	0.00	12.56
87	butyl acetate	0.183	0.197	-7.7	93	0.00	12.64
88	dibromochloromethane	0.349	0.367	-5.2	91	0.00	12.83
89	1,2-dibromoethane	0.268	0.285	-6.3	92	0.00	12.97
90	3,3-Dimethyl-1-Butanol	0.038	0.041	-7.9	88	0.00	12.73
91	chlorobenzene	1.043	1.022	2.0	88	-0.01	13.43

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123391.D

92	1,1,1,2-tetrachloroethane	0.437	0.455	-4.1	89	0.00	13.50
93	ethylbenzene	1.861	1.848	0.7	86	0.00	13.50
94	m,p-xylene	0.693	0.697	-0.6	85	0.00	13.60
95	o-xylene	1.537	1.567	-2.0	87	0.00	14.01
96	styrene	1.058	1.051	0.7	84	0.00	14.02
97	butyl acrylate			-----NA-----			
98	n-butyl ether	1.759	1.740	1.1	88	0.00	13.36
99	bromoform	0.224	0.239	-6.7	88	0.00	14.28
100 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	92	0.00	15.70
101	isopropylbenzene	3.622	3.676	-1.5	89	0.00	14.35
102 S	4-bromofluorobenzene (s)	0.943	0.906	3.9	87	0.00	14.55
103	bromobenzene	0.824	0.831	-0.8	89	0.00	14.75
104	cis-1,4-dichloro-2-butene			-----NA-----			
		-----	True	Calc.	% Drift	-----	
105	cyclohexanone	200.000	188.689	5.7	71	0.00	14.51
		-----	AvgRF	CCRF	% Dev	-----	
106	1,1,2,2-tetrachloroethane	0.720	0.727	-1.0	89	0.00	14.65
107	trans-1,4-dichloro-2-bute	0.195	0.201	-3.1	90	0.00	14.69
108	1,2,3-trichloropropane	0.190	0.208	-9.5	93	0.00	14.72
109	n-propylbenzene	4.059	3.876	4.5	86	0.00	14.76
110	4-Ethyltoluene			-----NA-----			
111	2-chlorotoluene	0.831	0.812	2.3	88	0.00	14.90
112	4-chlorotoluene	0.836	0.795	4.9	87	0.00	15.00
113	1,3,5-trimethylbenzene	3.165	3.112	1.7	88	0.00	14.91
114	tert-butylbenzene	2.688	2.583	3.9	86	0.00	15.25
115	pentachloroethane	0.514	0.608	-18.3	97	0.00	15.33
116	1,2,4-trimethylbenzene	3.045	3.037	0.3	89	0.00	15.30
117	sec-butylbenzene	4.212	4.136	1.8	85	0.00	15.47
118	1,3-dichlorobenzene	1.750	1.716	1.9	90	0.00	15.65
119	p-isopropyltoluene	3.561	3.456	2.9	85	0.00	15.58
120	1,4-dichlorobenzene	1.770	1.763	0.4	92	0.00	15.73
121	1,2-dichlorobenzene	1.742	1.726	0.9	91	0.00	16.12
122	1,4-Diethylbenzene			-----NA-----			
123	n-butylbenzene	1.767	1.775	-0.5	85	0.00	16.00
124	1,2,4,5-Tetramethylbenzen			-----NA-----			
125	1,2-dibromo-3-chloropropa	0.181	0.211	-16.6	105	0.00	16.88
126	1,3,5-Trichlorobenzene	1.696	1.806	-6.5	97	0.00	17.07
127	1,2,4-trichlorobenzene	1.521	1.683	-10.7	97	-0.01	17.70
128	hexachlorobutadiene	0.951	0.952	-0.1	91	0.00	17.82
129	naphthalene	2.969	3.317	-11.7	95	0.00	17.97
130	1,2,3-trichlorobenzene	1.494	1.595	-6.8	92	0.00	18.21
131	hexachloroethane	0.630	0.643	-2.1	89	0.00	16.38
132	Benzyl chloride	1.638	1.687	-3.0	86	0.00	15.84
		-----	-----	-----	-----	-----	-----

(#= Out of Range  
3C122770.D M3C5608.MSPCC's out = 0 CCC's out = 0  
Tue Sep 22 10:55:29 2015 T

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C123392.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\3C\V3C5637\3C123392.D Vial: 3  
 Acq On : 21 Sep 2015 2:44 pm Operator: PrashanS  
 Sample : CC5608-20 Inst : MS3C  
 Misc : MS91451,V3C5637,5.0,,,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)  
 Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 Last Update : Mon Sep 13 11:48:20 2010  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	83	0.01	7.10
2	1,4-dioxane	0.101	0.109	-7.9	88	0.00	10.97
3	tertiary butyl alcohol	1.225	1.394	-13.8	92	0.00	7.21
4	ethanol			-----NA-----			
5	I pentafluorobenzene	1.000	1.000	0.0	88	0.00	9.33
6	propene			-----NA-----			
7	chlorodifluoromethane	0.767	0.955	-24.5#	107	0.00	3.79
8	dichlorodifluoromethane	1.121	1.208	-7.8	91	0.00	3.79
9	chloromethane	0.719	0.686	4.6	88	0.00	4.10
10	vinyl chloride	0.737	0.754	-2.3	91	0.00	4.34
11	bromomethane	0.447	0.468	-4.7	99	0.00	4.98
12	chloroethane	0.348	0.364	-4.6	94	0.00	5.15
13	1,3-butadiene			-----NA-----			
14	Vinyl Bromide			-----NA-----			
15	Pentane			-----NA-----			
16	trichlorofluoromethane	0.841	0.950	-13.0	97	0.00	5.59
17	ethyl ether	0.217	0.221	-1.8	93	0.00	6.00
18	acrolein	0.066	0.063	4.5	87	0.00	6.24
19	1,1-dichloroethene	0.668	0.755	-13.0	94	0.00	6.42
20	acetone	0.135	0.109	19.3	54	0.00	6.48
21	allyl chloride	0.236	0.255	-8.1	92	0.00	6.95
22	acetonitrile	0.033	0.041	-24.2#	101	0.04	6.93
23	iodomethane	0.758	0.847	-11.7	97	0.00	6.69
24	iso-butyl alcohol	0.013	0.012	7.7	75	0.00	9.62
25	carbon disulfide	1.741	1.808	-3.8	90	0.00	6.82
26	methylene chloride	0.471	0.520	-10.4	96	0.00	7.13
27	methyl acetate	0.240	0.276	-15.0	92	0.00	6.94
28	methyl tert butyl ether	1.436	1.554	-8.2	98	0.00	7.47
29	trans-1,2-dichloroethene	0.649	0.707	-8.9	92	0.00	7.51
30	di-isopropyl ether	1.595	1.651	-3.5	92	0.00	8.07
31	ethyl tert-butyl ether	1.514	1.545	-2.0	90	0.00	8.53
32	2-butanone	0.042	0.036	14.3	64	0.00	8.80
33	1,1-dichloroethane	0.823	0.848	-3.0	91	0.00	8.07
34	chloroprene	0.631	0.682	-8.1	90	0.00	8.19
35	acrylonitrile	0.102	0.122	-19.6	91	0.00	7.45
36	vinyl acetate	20.000	18.041	9.8	74	0.00	8.08
37	ethyl acetate	0.041	0.044	-7.3	97	0.00	8.81

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123392.D

38	2,2-dichloropropane	0.892	0.964	-8.1	93	0.00	8.81
39	cis-1,2-dichloroethene	0.496	0.514	-3.6	91	0.00	8.81
40	propionitrile	0.041	0.046	-12.2	91	0.00	8.87
41	Methyl Acrylate	0.037	0.041	-10.8	97	0.02	8.90
42	bromochloromethane	0.205	0.218	-6.3	92	0.00	9.12
43	tetrahydrofuran	0.043	0.046	-7.0	88	0.00	9.17
44	chloroform	0.759	0.796	-4.9	94	0.00	9.18
45	tert-Butyl Formate	0.374	0.401	-7.2	91	0.00	9.21
46 S	dibromofluoromethane (s)	0.380	0.359	5.5	82	0.00	9.37
47 S	1,2-dichloroethane-d4 (s)	0.361	0.365	-1.1	85	0.00	9.79
48	freon 113	0.405	0.440	-8.6	96	0.00	6.39
49	methacrylonitrile	0.114	0.114	0.0	88	0.00	9.06
50	1,1,1-trichloroethane	0.837	0.935	-11.7	96	0.00	9.44
51	Cyclohexane	0.905	0.958	-5.9	93	0.00	9.51
52	Tert Amyl Alcohol			-----NA-----			
53	2,2,4-trimethylpentane	1.879	1.821	3.1	83	0.00	9.88
54	tert-amyl methyl ether	1.391	1.474	-6.0	94	0.00	9.91
55 I	1,4-difluorobenzene	1.000	1.000	0.0	82	0.00	10.25
56	epichlorohydrin	0.024	0.028	-16.7	84	0.00	11.51
57	n-butyl alcohol	0.009	0.010	-11.1	84	0.00	10.38
58	carbon tetrachloride	0.606	0.710	-17.2	98	0.00	9.65
59	1,1-dichloropropene	0.464	0.519	-11.9	90	0.00	9.61
60	hexane	0.479	0.484	-1.0	85	0.00	7.83
61	benzene	1.456	1.534	-5.4	88	0.00	9.88
62	heptane	0.277	0.300	-8.3	84	0.00	10.06
63	isopropyl acetate	0.054	0.060	-11.1	87	0.00	9.80
64	1,2-dichloroethane	0.381	0.421	-10.5	92	0.00	9.88
65	trichloroethene	0.329	0.358	-8.8	86	0.00	10.60
66	ethyl acrylate			-----NA-----			
67	Tert-Amyl ethyl ether			-----NA-----			
68	2-nitropropane	0.087	0.104	-19.5	100	0.00	11.37
69	2-chloroethyl vinyl ether	0.135	0.151	-11.9	90	0.00	11.39
70	methyl methacrylate	0.057	0.067	-17.5	92	0.00	10.88
71	1,2-dichloropropane	0.342	0.370	-8.2	89	0.00	10.85
72	methylcyclohexane	0.738	0.801	-8.5	89	0.00	10.82
73	dibromomethane	0.158	0.183	-15.8	89	-0.01	11.01
74	bromodichloromethane	0.412	0.470	-14.1	94	0.00	11.15
75	cis-1,3-dichloropropene	0.490	0.534	-9.0	90	0.00	11.61
76 S	toluene-d8 (s)	1.175	1.158	1.4	80	0.00	11.90
77	4-methyl-2-pentanone	0.095	0.114	-20.0#	95	0.00	11.71
78	toluene	1.394	1.473	-5.7	88	0.00	11.97
79	3-methyl-1-butanol	0.008	0.009	-12.5	89	0.00	11.73
80	trans-1,3-dichloropropene	0.426	0.472	-10.8	92	0.00	12.17
81	ethyl methacrylate	0.295	0.342	-15.9	91	0.00	12.17
82	1,1,2-trichloroethane	0.222	0.247	-11.3	89	0.00	12.38
83	2-hexanone	20.000	20.268	True Calc. -1.3	76	0.00	12.57
84 I	chlorobenzene-d5	1.000	1.000	AvgRF CCRF 0.0	81	0.00	13.41
85	tetrachloroethene	0.468	0.497	-6.2	85	0.00	12.56
86	1,3-dichloropropane	0.490	0.537	-9.6	89	0.00	12.56
87	butyl acetate	0.183	0.208	-13.7	90	0.00	12.64
88	dibromochloromethane	0.349	0.402	-15.2	92	0.00	12.83
89	1,2-dibromoethane	0.268	0.306	-14.2	91	0.00	12.98
90	3,3-Dimethyl-1-Butanol	0.038	0.043	-13.2	86	0.00	12.73
91	chlorobenzene	1.043	1.126	-8.0	89	0.00	13.44

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123392.D

92	1,1,1,2-tetrachloroethane	0.437	0.522	-19.5	94	0.00	13.50
93	ethylbenzene	1.861	2.112	-13.5	90	0.00	13.50
94	m,p-xylene	0.693	0.782	-12.8	88	0.00	13.60
95	o-xylene	1.537	1.770	-15.2	91	0.00	14.01
96	styrene	1.058	1.197	-13.1	88	0.00	14.02
97	butyl acrylate			-----NA-----			
98	n-butyl ether	1.759	1.996	-13.5	93	0.00	13.36
99	bromoform	0.224	0.273	-21.9#	93	0.00	14.28
100 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	84	0.00	15.71
101	isopropylbenzene	3.622	4.230	-16.8	93	0.00	14.35
102 S	4-bromofluorobenzene (s)	0.943	0.911	3.4	80	0.00	14.55
103	bromobenzene	0.824	0.912	-10.7	89	0.00	14.74
104	cis-1,4-dichloro-2-butene			-----NA-----			
		-----	True	Calc.	% Drift	-----	
105	cyclohexanone	200.000	200.919	-0.5	69	0.00	14.51
		-----	AvgRF	CCRF	% Dev	-----	
106	1,1,2,2-tetrachloroethane	0.720	0.800	-11.1	90	0.00	14.65
107	trans-1,4-dichloro-2-bute	0.195	0.210	-7.7	86	-0.01	14.69
108	1,2,3-trichloropropane	0.190	0.222	-16.8	90	0.00	14.72
109	n-propylbenzene	4.059	4.476	-10.3	91	0.00	14.76
110	4-Ethyltoluene			-----NA-----			
111	2-chlorotoluene	0.831	0.936	-12.6	92	0.00	14.90
112	4-chlorotoluene	0.836	0.889	-6.3	89	0.00	15.00
113	1,3,5-trimethylbenzene	3.165	3.567	-12.7	92	0.00	14.91
114	tert-butylbenzene	2.688	2.950	-9.7	90	0.00	15.25
115	pentachloroethane	0.514	0.694	-35.0#	102	0.00	15.33
116	1,2,4-trimethylbenzene	3.045	3.493	-14.7	94	0.00	15.29
117	sec-butylbenzene	4.212	4.776	-13.4	90	0.00	15.46
118	1,3-dichlorobenzene	1.750	1.970	-12.6	94	0.00	15.65
119	p-isopropyltoluene	3.561	4.024	-13.0	90	0.00	15.58
120	1,4-dichlorobenzene	1.770	2.000	-13.0	95	0.00	15.73
121	1,2-dichlorobenzene	1.742	1.962	-12.6	95	0.00	16.12
122	1,4-Diethylbenzene			-----NA-----			
123	n-butylbenzene	1.767	2.092	-18.4	92	0.00	16.00
124	1,2,4,5-Tetramethylbenzen			-----NA-----			
125	1,2-dibromo-3-chloropropa	0.181	0.215	-18.8	98	0.00	16.88
126	1,3,5-Trichlorobenzene	1.696	2.062	-21.6#	101	0.00	17.07
127	1,2,4-trichlorobenzene	1.521	1.879	-23.5#	99	0.00	17.70
128	hexachlorobutadiene	0.951	1.066	-12.1	93	0.00	17.82
129	naphthalene	2.969	3.622	-22.0#	94	0.00	17.97
130	1,2,3-trichlorobenzene	1.494	1.792	-19.9	95	0.00	18.21
131	hexachloroethane	0.630	0.682	-8.3	87	0.00	16.38
132	Benzyl chloride	1.638	1.845	-12.6	86	0.00	15.84
		-----	-----	-----	-----	-----	-----

(#= Out of Range  
3C122770.D M3C5608.MSPCC's out = 0 CCC's out = 0  
Tue Sep 22 10:55:31 2015 T

# Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C123393.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\3C\V3C5637\3C123393.D Vial: 4  
 Acq On : 21 Sep 2015 3:20 pm Operator: PrashanS  
 Sample : CC5608-10 Inst : MS3C  
 Misc : MS91451,V3C5637,5.0,,,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)  
 Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 Last Update : Mon Sep 13 11:48:20 2010  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	110	0.00	7.09
2	1,4-dioxane		-----NA-----				
3	tertiary butyl alcohol		-----NA-----				
4	ethanol		-----NA-----				
5	I pentafluorobenzene	1.000	1.000	0.0	109	-0.01	9.33
6	propene		-----NA-----				
7	chlorodifluoromethane		-----NA-----				
8	dichlorodifluoromethane		-----NA-----				
9	chloromethane		-----NA-----				
10	v vinyl chloride		-----NA-----				
11	bromomethane		-----NA-----				
12	chloroethane		-----NA-----				
13	1,3-butadiene		-----NA-----				
14	Vinyl Bromide		-----NA-----				
15	Pentane		-----NA-----				
16	trichlorofluoromethane		-----NA-----				
17	ethyl ether		-----NA-----				
18	acrolein		-----NA-----				
19	1,1-dichloroethene		-----NA-----				
20	acetone		-----NA-----				
21	allyl chloride		-----NA-----				
22	acetonitrile		-----NA-----				
23	iodomethane		-----NA-----				
24	iso-butyl alcohol		-----NA-----				
25	carbon disulfide		-----NA-----				
26	methylene chloride		-----NA-----				
27	methyl acetate		-----NA-----				
28	methyl tert butyl ether		-----NA-----				
29	trans-1,2-dichloroethene		-----NA-----				
30	di-isopropyl ether		-----NA-----				
31	ethyl tert-butyl ether		-----NA-----				
32	2-butanone	0.042	0.055	-31.0	193	0.02	8.81
33	1,1-dichloroethane		-----NA-----				
34	chloroprene		-----NA-----				
35	acrylonitrile		-----NA-----				
36	vinyl acetate		-----True-----	Calc.	% Drift	-----	
37	ethyl acetate		-----AvgRF-----	CCRF	% Dev	-----	

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123393.D

38	2,2-dichloropropane		-----	-NA-----	
39	cis-1,2-dichloroethene		-----	-NA-----	
40	propionitrile		-----	-NA-----	
41	Methyl Acrylate		-----	-NA-----	
42	bromochloromethane		-----	-NA-----	
43	tetrahydrofuran		-----	-NA-----	
44	chloroform		-----	-NA-----	
45	tert-Butyl Formate		-----	-NA-----	
46 S	dibromofluoromethane (s)	0.380	0.354	6.8 101 -0.01	9.37
47 S	1,2-dichloroethane-d4 (s)	0.361	0.364	-0.8 108 0.00	9.79
48	freon 113		-----	-NA-----	
49	methacrylonitrile		-----	-NA-----	
50	1,1,1-trichloroethane		-----	-NA-----	
51	Cyclohexane		-----	-NA-----	
52	Tert Amyl Alcohol		-----	-NA-----	
53	2,2,4-trimethylpentane		-----	-NA-----	
54	tert-amyl methyl ether		-----	-NA-----	
55 I	1,4-difluorobenzene	1.000	1.000	0.0 102 0.00	10.25
56	epichlorohydrin		-----	-NA-----	
57	n-butyl alcohol		-----	-NA-----	
58	carbon tetrachloride		-----	-NA-----	
59	1,1-dichloropropene		-----	-NA-----	
60	hexane		-----	-NA-----	
61	benzene		-----	-NA-----	
62	heptane		-----	-NA-----	
63	isopropyl acetate		-----	-NA-----	
64	1,2-dichloroethane		-----	-NA-----	
65	trichloroethene		-----	-NA-----	
66	ethyl acrylate		-----	-NA-----	
67	Tert-Amyl ethyl ether		-----	-NA-----	
68	2-nitropropane		-----	-NA-----	
69	2-chloroethyl vinyl ether		-----	-NA-----	
70	methyl methacrylate		-----	-NA-----	
71	1,2-dichloropropane		-----	-NA-----	
72	methylcyclohexane		-----	-NA-----	
73	dibromomethane		-----	-NA-----	
74	bromodichloromethane		-----	-NA-----	
75	cis-1,3-dichloropropene		-----	-NA-----	
76 S	toluene-d8 (s)	1.175	1.159	1.4 100 0.00	11.90
77	4-methyl-2-pentanone		-----	-NA-----	
78	toluene		-----	-NA-----	
79	3-methyl-1-butanol		-----	-NA-----	
80	trans-1,3-dichloropropene		-----	-NA-----	
81	ethyl methacrylate		-----	-NA-----	
82	1,1,2-trichloroethane		-----	-NA-----	
83	2-hexanone	-----	True	Calc. % Drift -----	
84 I	chlorobenzene-d5	1.000	AvgRF 1.000	CCRF 0.0 97 0.00	----- 13.41
85	tetrachloroethene		-----	-NA-----	
86	1,3-dichloropropane		-----	-NA-----	
87	butyl acetate		-----	-NA-----	
88	dibromochloromethane		-----	-NA-----	
89	1,2-dibromoethane		-----	-NA-----	
90	3,3-Dimethyl-1-Butanol		-----	-NA-----	
91	chlorobenzene		-----	-NA-----	

**Continuing Calibration Summary**

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123393.D

92	1,1,1,2-tetrachloroethane	-----	-NA-----
93	ethylbenzene	-----	-NA-----
94	m,p-xylene	-----	-NA-----
95	o-xylene	-----	-NA-----
96	styrene	-----	-NA-----
97	butyl acrylate	-----	-NA-----
98	n-butyl ether	-----	-NA-----
99	bromoform	-----	-NA-----
100 I	1,4-dichlorobenzene-d4	1.000	1.000 0.0 98 0.00 15.71
101	isopropylbenzene	-----	-NA-----
102 S	4-bromofluorobenzene (s)	0.943	0.927 1.7 96 0.00 14.55
103	bromobenzene	-----	-NA-----
104	cis-1,4-dichloro-2-butene	-----	-NA-----
		-----	----- True Calc. % Drift -----
105	cyclohexanone		-----
		-----	----- AvgRF CCRF % Dev -----
106	1,1,2,2-tetrachloroethane		-----
107	trans-1,4-dichloro-2-bute		-----
108	1,2,3-trichloropropane		-----
109	n-propylbenzene		-----
110	4-Ethyltoluene		-----
111	2-chlorotoluene		-----
112	4-chlorotoluene		-----
113	1,3,5-trimethylbenzene		-----
114	tert-butylbenzene		-----
115	pentachloroethane		-----
116	1,2,4-trimethylbenzene		-----
117	sec-butylbenzene		-----
118	1,3-dichlorobenzene		-----
119	p-isopropyltoluene		-----
120	1,4-dichlorobenzene		-----
121	1,2-dichlorobenzene		-----
122	1,4-Diethylbenzene		-----
123	n-butylbenzene		-----
124	1,2,4,5-Tetramethylbenzen		-----
125	1,2-dibromo-3-chloropropane		-----
126	1,3,5-Trichlorobenzene		-----
127	1,2,4-trichlorobenzene		-----
128	hexachlorobutadiene		-----
129	naphthalene		-----
130	1,2,3-trichlorobenzene		-----
131	hexachloroethane		-----
132	Benzyl chloride		-----

(#= Out of Range  
3C122769.D M3C5608.MSPCC's out = 0 CCC's out = 0  
Tue Sep 22 10:59:53 2015 T

## Continuing Calibration Summary

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 3C123394.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\3C\V3C5637\3C123394.D Vial: 5  
 Acq On : 21 Sep 2015 3:48 pm Operator: PrashanS  
 Sample : CC5608-1 Inst : MS3C  
 Misc : MS91451,V3C5637,5.0,,,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M3C5608.M (RTE Integrator)  
 Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 Last Update : Mon Sep 13 11:48:20 2010  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I Tert Butyl Alcohol-d9	1.000	1.000	0.0	86	0.00	7.09
2	1,4-dioxane		-----NA-----				
3	tertiary butyl alcohol		-----NA-----				
4	ethanol		-----NA-----				
5	I pentafluorobenzene	1.000	1.000	0.0	87	0.00	9.33
6	propene		-----NA-----				
7	chlorodifluoromethane		-----NA-----				
8	dichlorodifluoromethane		-----NA-----				
9	chloromethane	0.719	0.942	-31.0	100	-0.01	4.09
10	v vinyl chloride		-----NA-----				
11	bromomethane		-----NA-----				
12	chloroethane		-----NA-----				
13	1,3-butadiene		-----NA-----				
14	Vinyl Bromide		-----NA-----				
15	Pentane		-----NA-----				
16	trichlorofluoromethane		-----NA-----				
17	ethyl ether		-----NA-----				
18	acrolein		-----NA-----				
19	1,1-dichloroethene		-----NA-----				
20	acetone		-----NA-----				
21	allyl chloride		-----NA-----				
22	acetonitrile		-----NA-----				
23	iodomethane		-----NA-----				
24	iso-butyl alcohol		-----NA-----				
25	carbon disulfide		-----NA-----				
26	methylene chloride		-----NA-----				
27	methyl acetate		-----NA-----				
28	methyl tert butyl ether		-----NA-----				
29	trans-1,2-dichloroethene		-----NA-----				
30	di-isopropyl ether		-----NA-----				
31	ethyl tert-butyl ether		-----NA-----				
32	2-butanone		-----NA-----				
33	1,1-dichloroethane		-----NA-----				
34	chloroprene		-----NA-----				
35	acrylonitrile		-----NA-----				
36	vinyl acetate	-----True	Calc.	% Drift	-----		
37	ethyl acetate	-----AvgRF	CCRF	% Dev	-----		

# Continuing Calibration Summary

Page 2 of 3

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123394.D

38	2,2-dichloropropane		-----	-NA-----
39	cis-1,2-dichloroethene		-----	-NA-----
40	propionitrile		-----	-NA-----
41	Methyl Acrylate		-----	-NA-----
42	bromochloromethane		-----	-NA-----
43	tetrahydrofuran		-----	-NA-----
44	chloroform		-----	-NA-----
45	tert-Butyl Formate		-----	-NA-----
46 S	dibromofluoromethane (s)	0.380	0.345	9.2 81 -0.01 9.37
47 S	1,2-dichloroethane-d4 (s)	0.361	0.350	3.0 84 0.00 9.79
48	freon 113		-----	-NA-----
49	methacrylonitrile		-----	-NA-----
50	1,1,1-trichloroethane		-----	-NA-----
51	Cyclohexane		-----	-NA-----
52	Tert Amyl Alcohol		-----	-NA-----
53	2,2,4-trimethylpentane		-----	-NA-----
54	tert-amyl methyl ether		-----	-NA-----
55 I	1,4-difluorobenzene	1.000	1.000	0.0 80 0.00 10.25
56	epichlorohydrin		-----	-NA-----
57	n-butyl alcohol		-----	-NA-----
58	carbon tetrachloride		-----	-NA-----
59	1,1-dichloropropene		-----	-NA-----
60	hexane		-----	-NA-----
61	benzene		-----	-NA-----
62	heptane		-----	-NA-----
63	isopropyl acetate		-----	-NA-----
64	1,2-dichloroethane		-----	-NA-----
65	trichloroethene		-----	-NA-----
66	ethyl acrylate		-----	-NA-----
67	Tert-Amyl ethyl ether		-----	-NA-----
68	2-nitropropane		-----	-NA-----
69	2-chloroethyl vinyl ether		-----	-NA-----
70	methyl methacrylate		-----	-NA-----
71	1,2-dichloropropane		-----	-NA-----
72	methylcyclohexane		-----	-NA-----
73	dibromomethane		-----	-NA-----
74	bromodichloromethane		-----	-NA-----
75	cis-1,3-dichloropropene		-----	-NA-----
76 S	toluene-d8 (s)	1.175	1.163	1.0 80 0.00 11.90
77	4-methyl-2-pentanone		-----	-NA-----
78	toluene		-----	-NA-----
79	3-methyl-1-butanol		-----	-NA-----
80	trans-1,3-dichloropropene		-----	-NA-----
81	ethyl methacrylate		-----	-NA-----
82	1,1,2-trichloroethane		-----	-NA-----
83	2-hexanone		-----	True Calc. % Drift ----- ----- -NA-----
84 I	chlorobenzene-d5	1.000	AvgRF 1.000	CCRF 0.0 80 0.00 13.41
85	tetrachloroethene		-----	-NA-----
86	1,3-dichloropropane		-----	-NA-----
87	butyl acetate		-----	-NA-----
88	dibromochloromethane		-----	-NA-----
89	1,2-dibromoethane		-----	-NA-----
90	3,3-Dimethyl-1-Butanol		-----	-NA-----
91	chlorobenzene		-----	-NA-----

6.7.6  
6

**Continuing Calibration Summary**

Job Number: JC4006

Sample: V3C5637-CC5608

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 3C123394.D

92	1,1,1,2-tetrachloroethane		-----	-NA-----							
93	ethylbenzene		-----	-NA-----							
94	m,p-xylene		-----	-NA-----							
95	o-xylene		-----	-NA-----							
96	styrene		-----	-NA-----							
97	butyl acrylate		-----	-NA-----							
98	n-butyl ether		-----	-NA-----							
99	bromoform		-----	-NA-----							
100 I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	84	0.00	15.71				
101	isopropylbenzene		-----	-NA-----							
102 S	4-bromofluorobenzene (s)	0.943	0.887	5.9	79	0.00	14.55				
103	bromobenzene		-----	-NA-----							
104	cis-1,4-dichloro-2-butene		-----	-NA-----							
		-----	True	Calc.	% Drift	-----					
105	cyclohexanone		-----	-NA-----							
		-----	AvgRF	CCRF	% Dev	-----					
106	1,1,2,2-tetrachloroethane		-----	-NA-----							
107	trans-1,4-dichloro-2-bute		-----	-NA-----							
108	1,2,3-trichloropropane		-----	-NA-----							
109	n-propylbenzene		-----	-NA-----							
110	4-Ethyltoluene		-----	-NA-----							
111	2-chlorotoluene		-----	-NA-----							
112	4-chlorotoluene		-----	-NA-----							
113	1,3,5-trimethylbenzene		-----	-NA-----							
114	tert-butylbenzene		-----	-NA-----							
115	pentachloroethane		-----	-NA-----							
116	1,2,4-trimethylbenzene		-----	-NA-----							
117	sec-butylbenzene		-----	-NA-----							
118	1,3-dichlorobenzene		-----	-NA-----							
119	p-isopropyltoluene		-----	-NA-----							
120	1,4-dichlorobenzene		-----	-NA-----							
121	1,2-dichlorobenzene		-----	-NA-----							
122	1,4-Diethylbenzene		-----	-NA-----							
123	n-butylbenzene		-----	-NA-----							
124	1,2,4,5-Tetramethylbenzen		-----	-NA-----							
125	1,2-dibromo-3-chloropropane		-----	-NA-----							
126	1,3,5-Trichlorobenzene		-----	-NA-----							
127	1,2,4-trichlorobenzene		-----	-NA-----							
128	hexachlorobutadiene		-----	-NA-----							
129	naphthalene		-----	-NA-----							
130	1,2,3-trichlorobenzene		-----	-NA-----							
131	hexachloroethane		-----	-NA-----							
132	Benzyl chloride		-----	-NA-----							

(#= Out of Range  
3C122766.D M3C5608.MSPCC's out = 0 CCC's out = 0  
Tue Sep 22 11:00:44 2015 T6.7.6  
6



## GC/MS Volatiles

---

### Raw Data

---

7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123409.D  
 Acq On : 21 Sep 2015 11:11 pm  
 Operator : PrashanS  
 Sample : JC4006-1  
 Misc : MS91359,V3C5637,5.8,,,1  
 ALS Vial : 20 Sample Multiplier: 1

Quant Time: Sep 22 11:25:06 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration

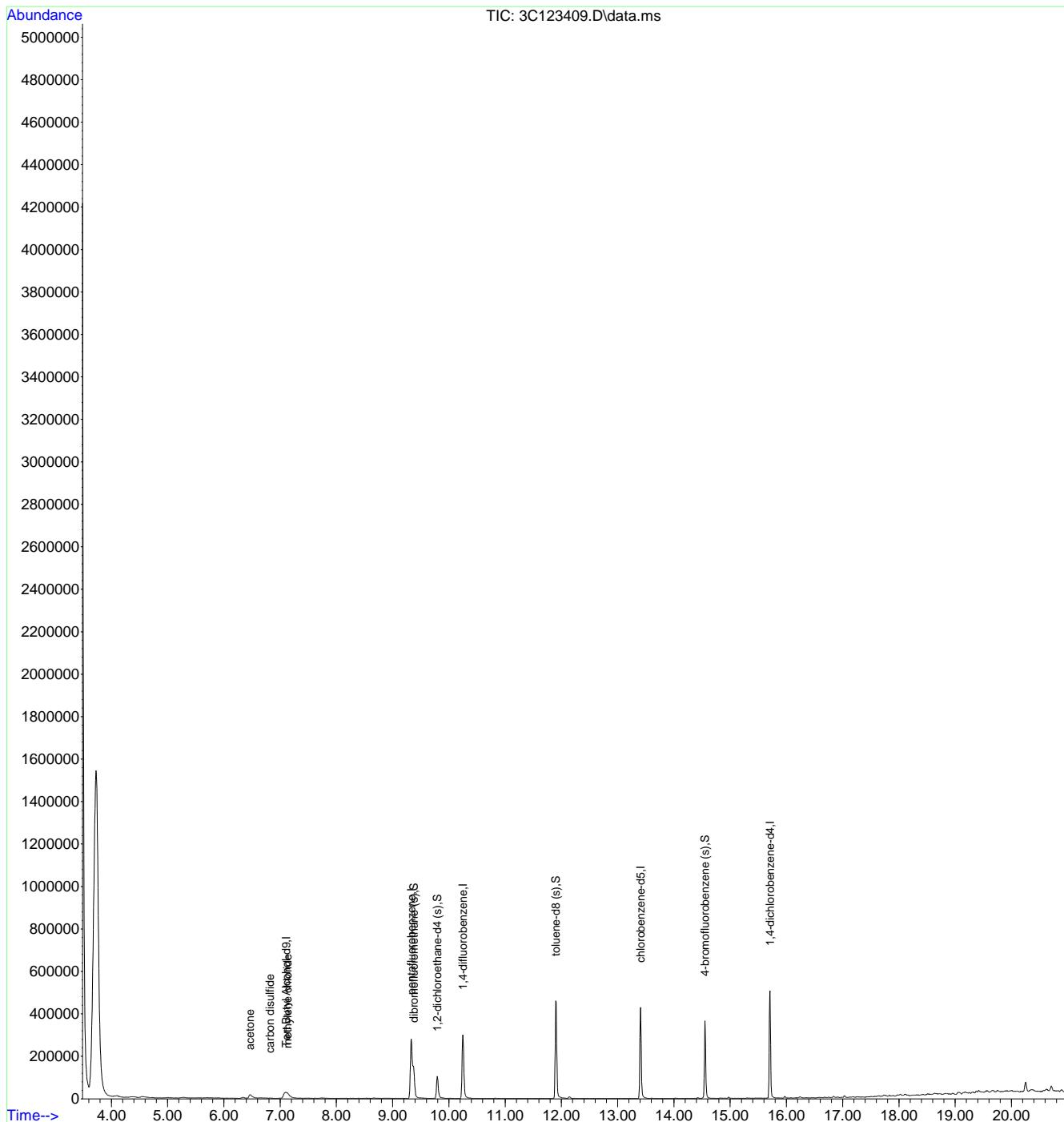
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) Tert Butyl Alcohol-d9	7.104	65	107064	500.00	ug/L	0.02
5) pentafluorobenzene	9.332	168	253715	50.00	ug/L	0.00
55) 1,4-difluorobenzene	10.248	114	296110	50.00	ug/L	0.00
84) chlorobenzene-d5	13.407	117	241017	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	15.708	152	132799	50.00	ug/L	0.00
<hr/>						
System Monitoring Compounds						
46) dibromofluoromethane (s)	9.374	113	90734	47.06	ug/L	0.00
Spiked Amount 50.000	Range 70 - 122		Recovery =	94.12%		
47) 1,2-dichloroethane-d4 (s)	9.793	65	88972	48.60	ug/L	0.00
Spiked Amount 50.000	Range 68 - 124		Recovery =	97.20%		
76) toluene-d8 (s)	11.900	98	343136	49.33	ug/L	0.00
Spiked Amount 50.000	Range 77 - 125		Recovery =	98.66%		
102) 4-bromofluorobenzene (s)	14.552	95	121855	48.68	ug/L	0.00
Spiked Amount 50.000	Range 72 - 130		Recovery =	97.36%		
<hr/>						
Target Compounds						
20) acetone	6.461	43	54008	79.03	ug/L	89
25) carbon disulfide	6.817	76	2250	0.25	ug/L	66
26) methylene chloride	7.130	84	2059	0.86	ug/L	92
<hr/>						

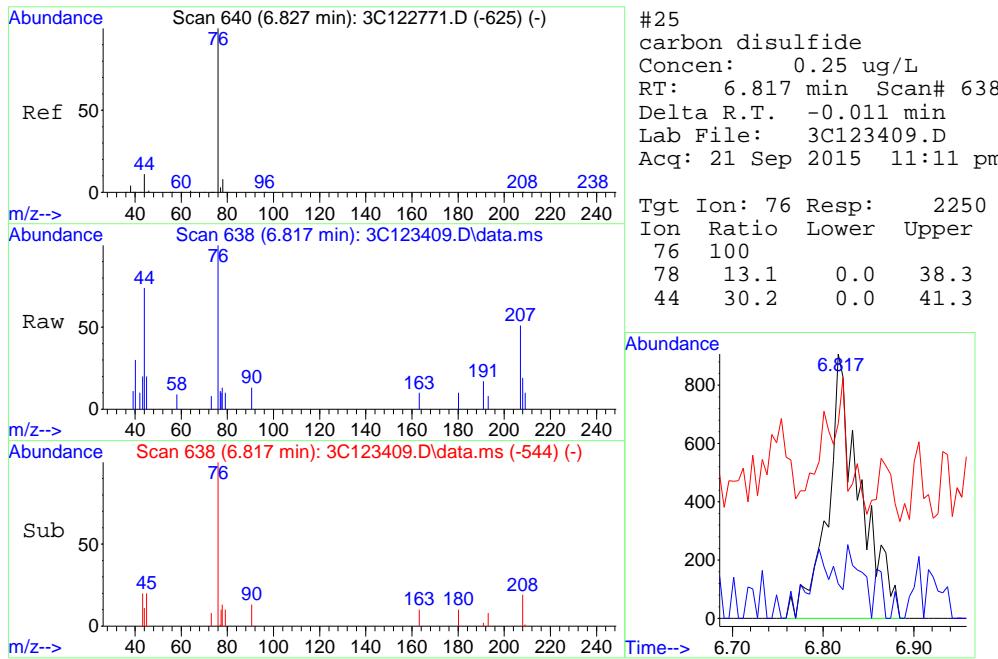
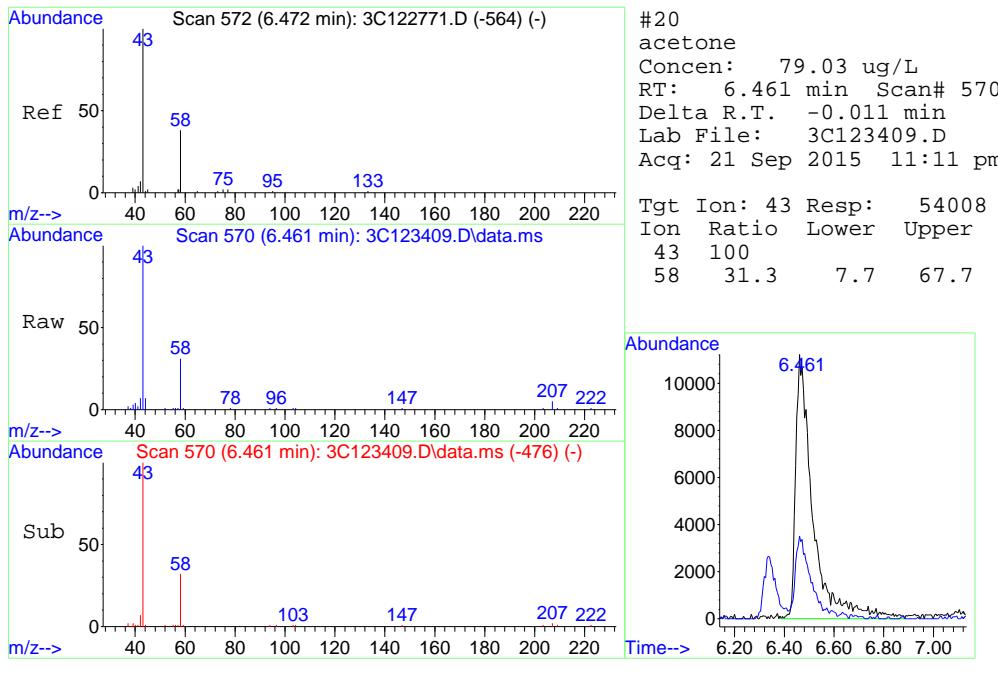
(#) = qualifier out of range (m) = manual integration (+) = signals summed

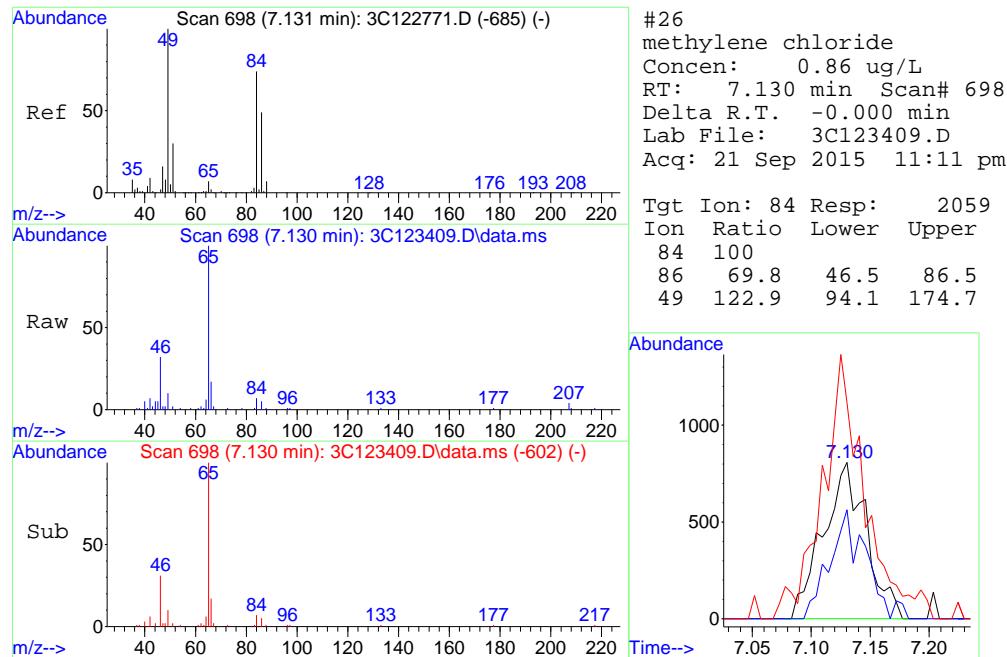
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123409.D  
 Acq On : 21 Sep 2015 11:11 pm  
 Operator : PrashanS  
 Sample : JC4006-1  
 Misc : MS91359,V3C5637,5.8,,,1  
 ALS Vial : 20 Sample Multiplier: 1

Quant Time: Sep 22 11:25:06 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration







## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123410.D  
 Acq On : 21 Sep 2015 11:39 pm  
 Operator : PrashanS  
 Sample : JC4006-2  
 Misc : MS91359,V3C5637,5.6,,,1  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Sep 22 11:14:42 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration

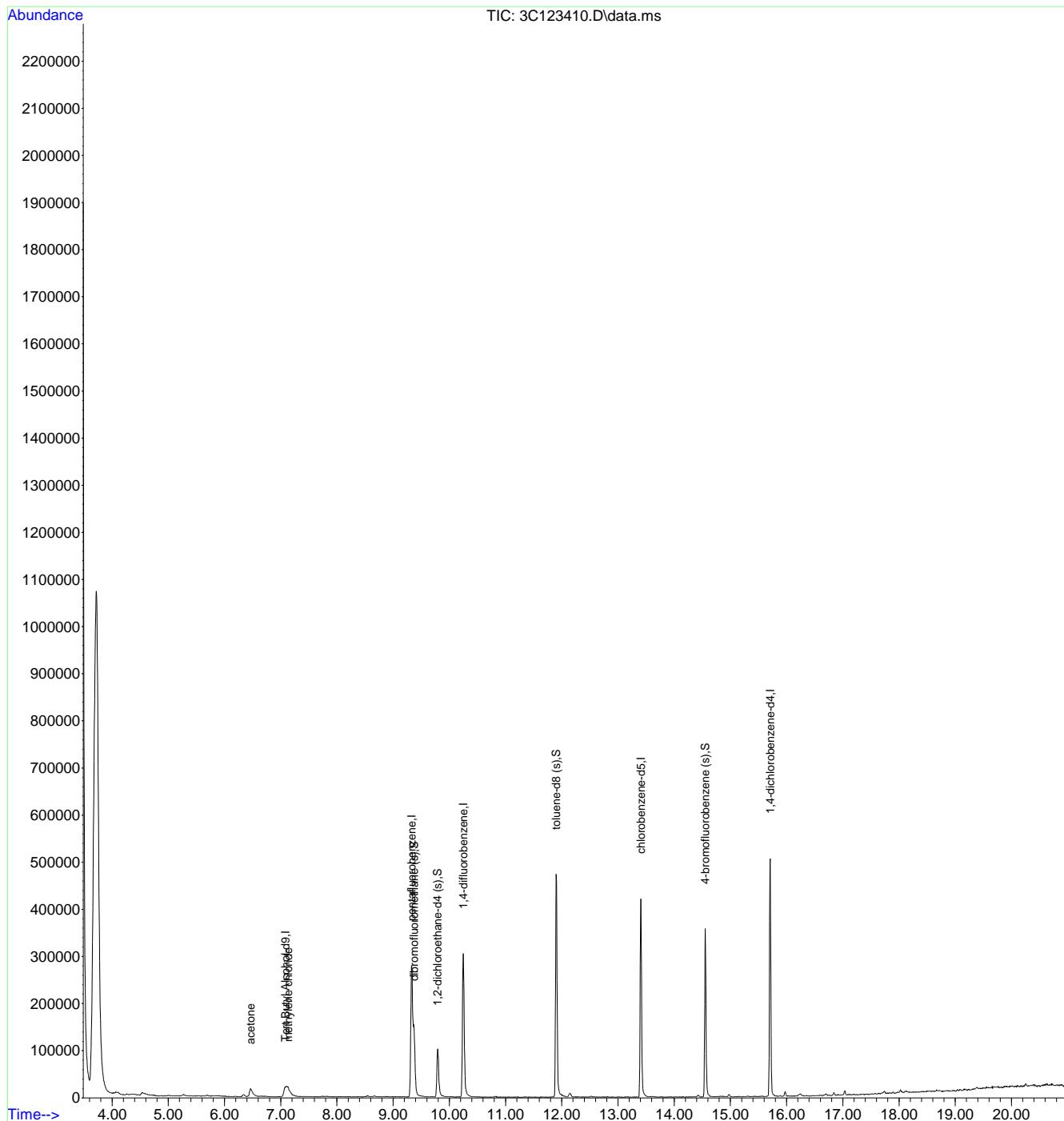
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<hr/>						
Internal Standards						
1) Tert Butyl Alcohol-d9	7.084	65	86154	500.00	ug/L	0.00
5) pentafluorobenzene	9.327	168	252863	50.00	ug/L	-0.01
55) 1,4-difluorobenzene	10.248	114	302830	50.00	ug/L	0.00
84) chlorobenzene-d5	13.407	117	242614	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	15.708	152	131852	50.00	ug/L	0.00
<hr/>						
System Monitoring Compounds						
46) dibromofluoromethane (s)	9.369	113	90259	46.97	ug/L	-0.01
Spiked Amount 50.000	Range 70 - 122			Recovery =	93.94%	
47) 1,2-dichloroethane-d4 (s)	9.788	65	89830	49.24	ug/L	-0.01
Spiked Amount 50.000	Range 68 - 124			Recovery =	98.48%	
76) toluene-d8 (s)	11.901	98	344585	48.44	ug/L	0.00
Spiked Amount 50.000	Range 77 - 125			Recovery =	96.88%	
102) 4-bromofluorobenzene (s)	14.552	95	120946	48.66	ug/L	0.00
Spiked Amount 50.000	Range 72 - 130			Recovery =	97.32%	
<hr/>						
Target Compounds						
20) acetone	6.461	43	48241	70.83	ug/L	87
26) methylene chloride	7.131	84	2255	0.95	ug/L #	66
<hr/>						

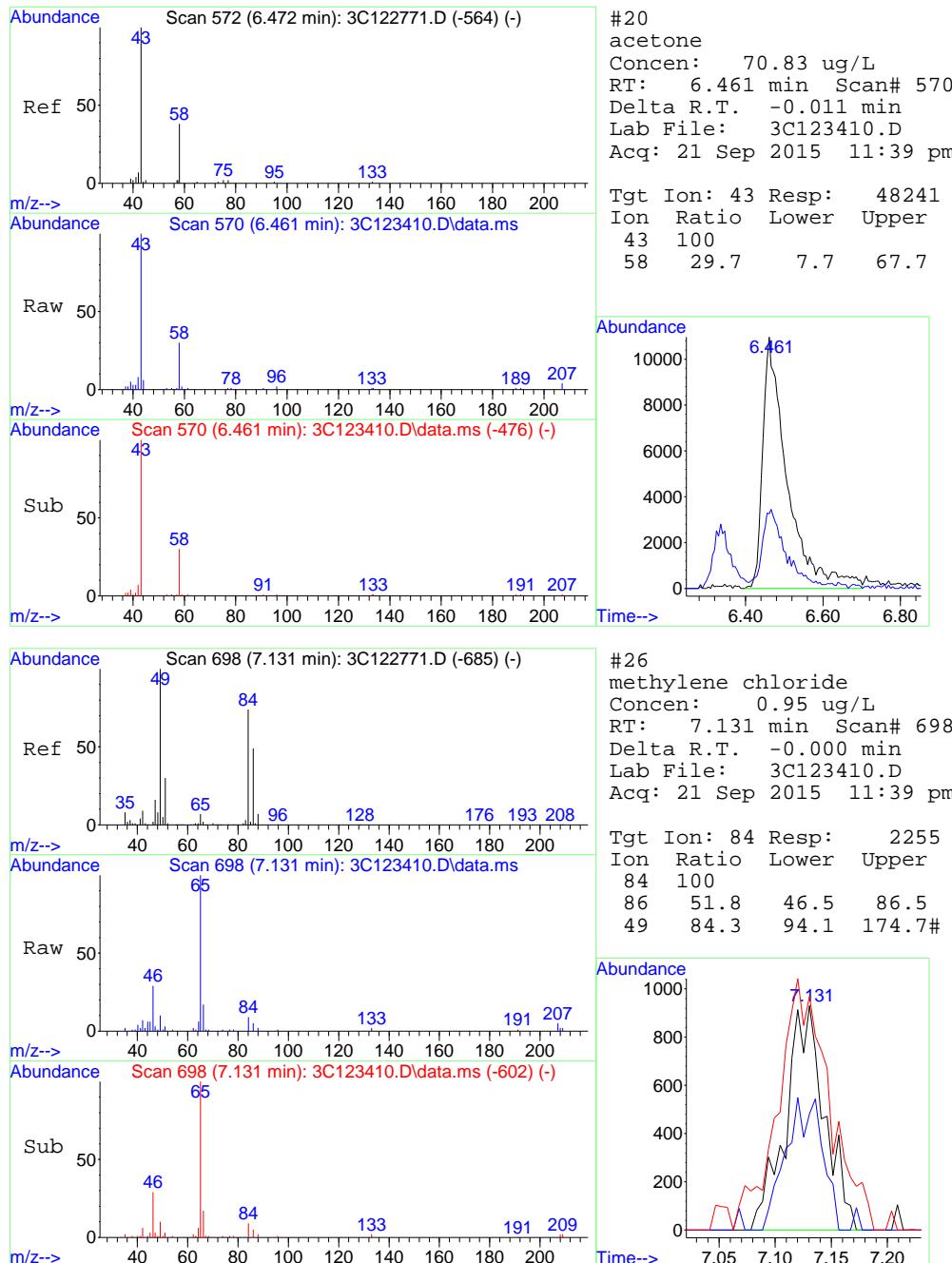
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123410.D  
 Acq On : 21 Sep 2015 11:39 pm  
 Operator : PrashanS  
 Sample : JC4006-2  
 Misc : MS91359,V3C5637,5.6,,,1  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Sep 22 11:14:42 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration





## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123411.D  
 Acq On : 22 Sep 2015 12:06 am  
 Operator : PrashanS  
 Sample : JC4006-3  
 Misc : MS91359,V3C5637,5.1,,,1  
 ALS Vial : 22 Sample Multiplier: 1

Quant Time: Sep 22 11:15:21 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration

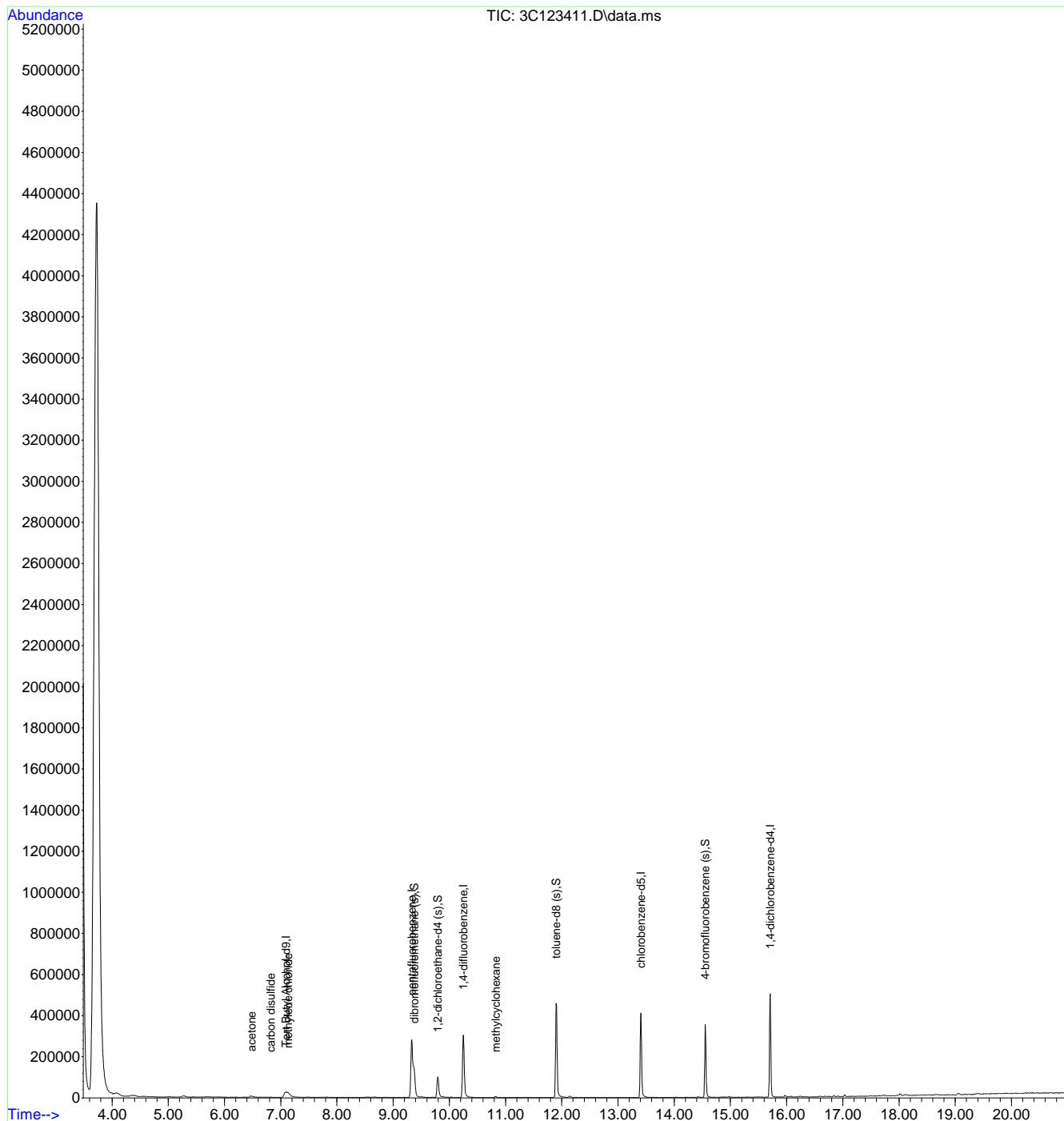
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<b>Internal Standards</b>						
1) Tert Butyl Alcohol-d9	7.094	65	97692	500.00	ug/L	0.00
5) pentafluorobenzene	9.332	168	249886	50.00	ug/L	0.00
55) 1,4-difluorobenzene	10.248	114	296489	50.00	ug/L	0.00
84) chlorobenzene-d5	13.407	117	235054	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	15.708	152	129781	50.00	ug/L	0.00
<b>System Monitoring Compounds</b>						
46) dibromofluoromethane (s)	9.374	113	89591	47.18	ug/L	0.00
Spiked Amount 50.000	Range 70 - 122		Recovery = 94.36%			
47) 1,2-dichloroethane-d4 (s)	9.793	65	89294	49.53	ug/L	0.00
Spiked Amount 50.000	Range 68 - 124		Recovery = 99.06%			
76) toluene-d8 (s)	11.900	98	340128	48.83	ug/L	0.00
Spiked Amount 50.000	Range 77 - 125		Recovery = 97.66%			
102) 4-bromofluorobenzene (s)	14.552	95	120007	49.05	ug/L	0.00
Spiked Amount 50.000	Range 72 - 130		Recovery = 98.10%			
<b>Target Compounds</b>						
				Qvalue		
20) acetone	6.482	43	21608	32.10	ug/L	84
25) carbon disulfide	6.822	76	1861	0.21	ug/L #	45
26) methylene chloride	7.130	84	2013	0.86	ug/L #	72
72) methylcyclohexane	10.828	83	2317	0.53	ug/L	90

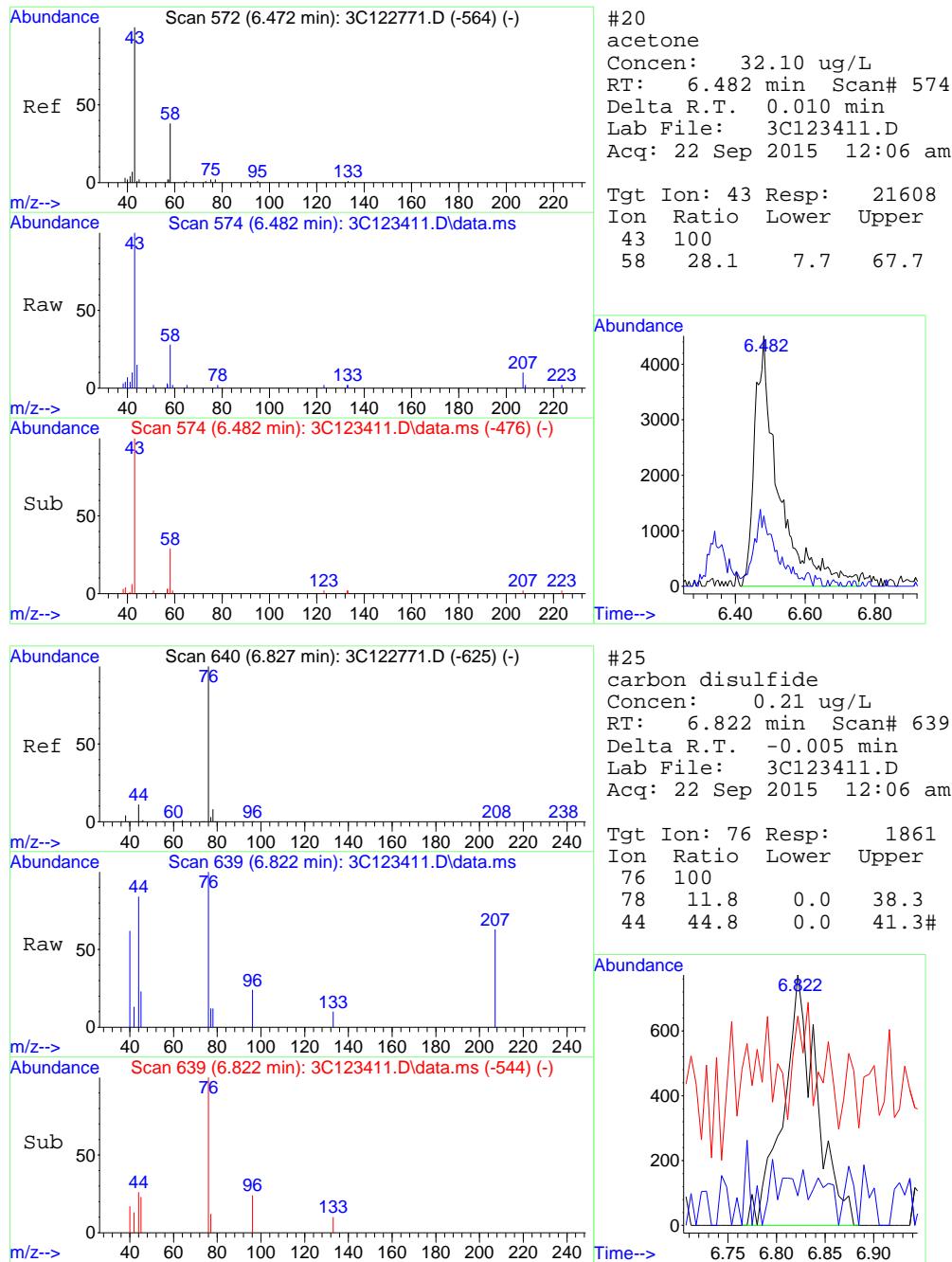
(#) = qualifier out of range (m) = manual integration (+) = signals summed

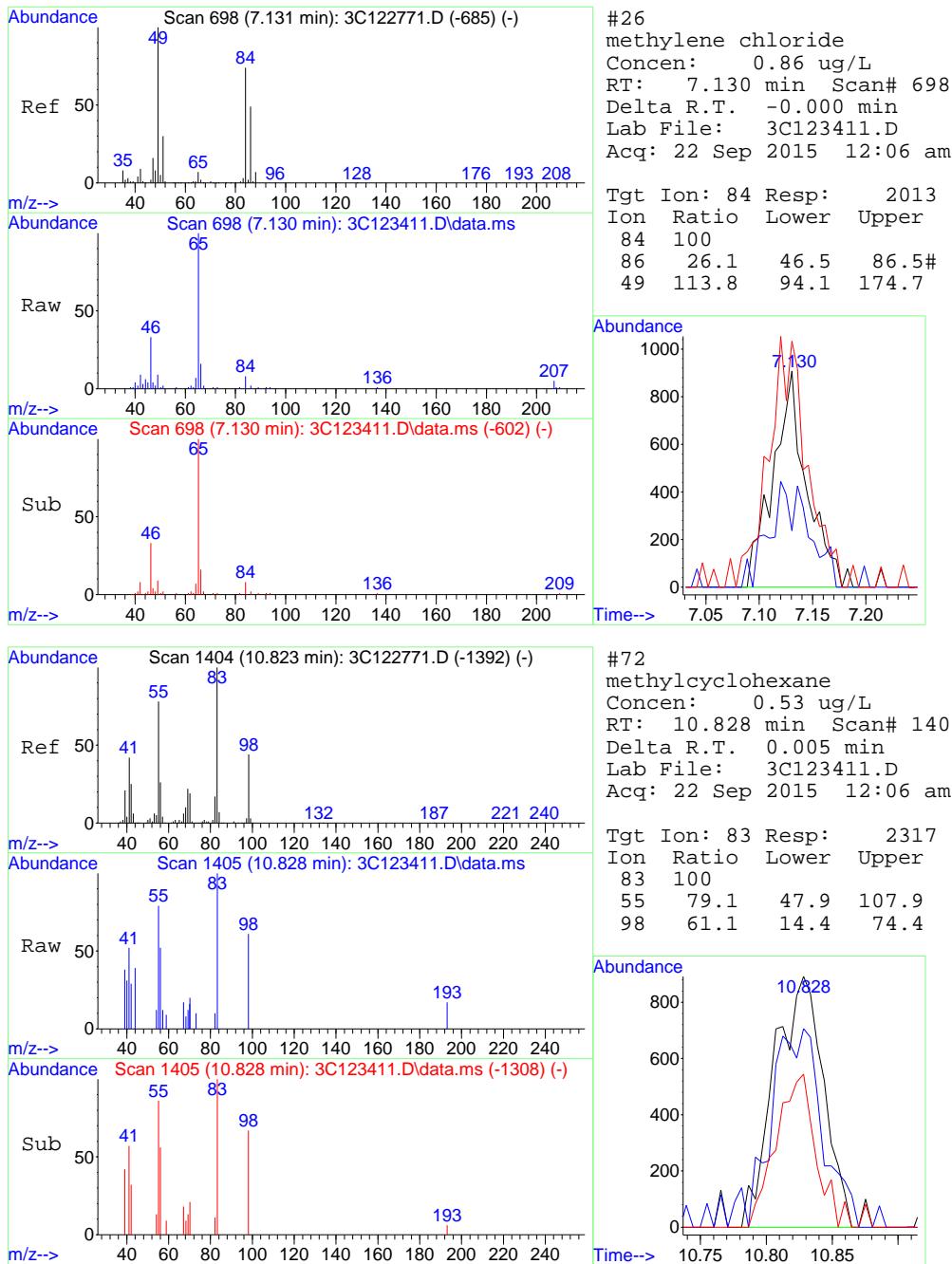
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123411.D  
 Acq On : 22 Sep 2015 12:06 am  
 Operator : PrashanS  
 Sample : JC4006-3  
 Misc : MS91359,V3C5637,5.1,,,1  
 ALS Vial : 22 Sample Multiplier: 1

Quant Time: Sep 22 11:15:21 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration







## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123412.D  
 Acq On : 22 Sep 2015 12:34 am  
 Operator : PrashanS  
 Sample : JC4006-4  
 Misc : MS91359,V3C5637,4.4,,,1  
 ALS Vial : 23 Sample Multiplier: 1

Quant Time: Sep 22 11:16:22 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration

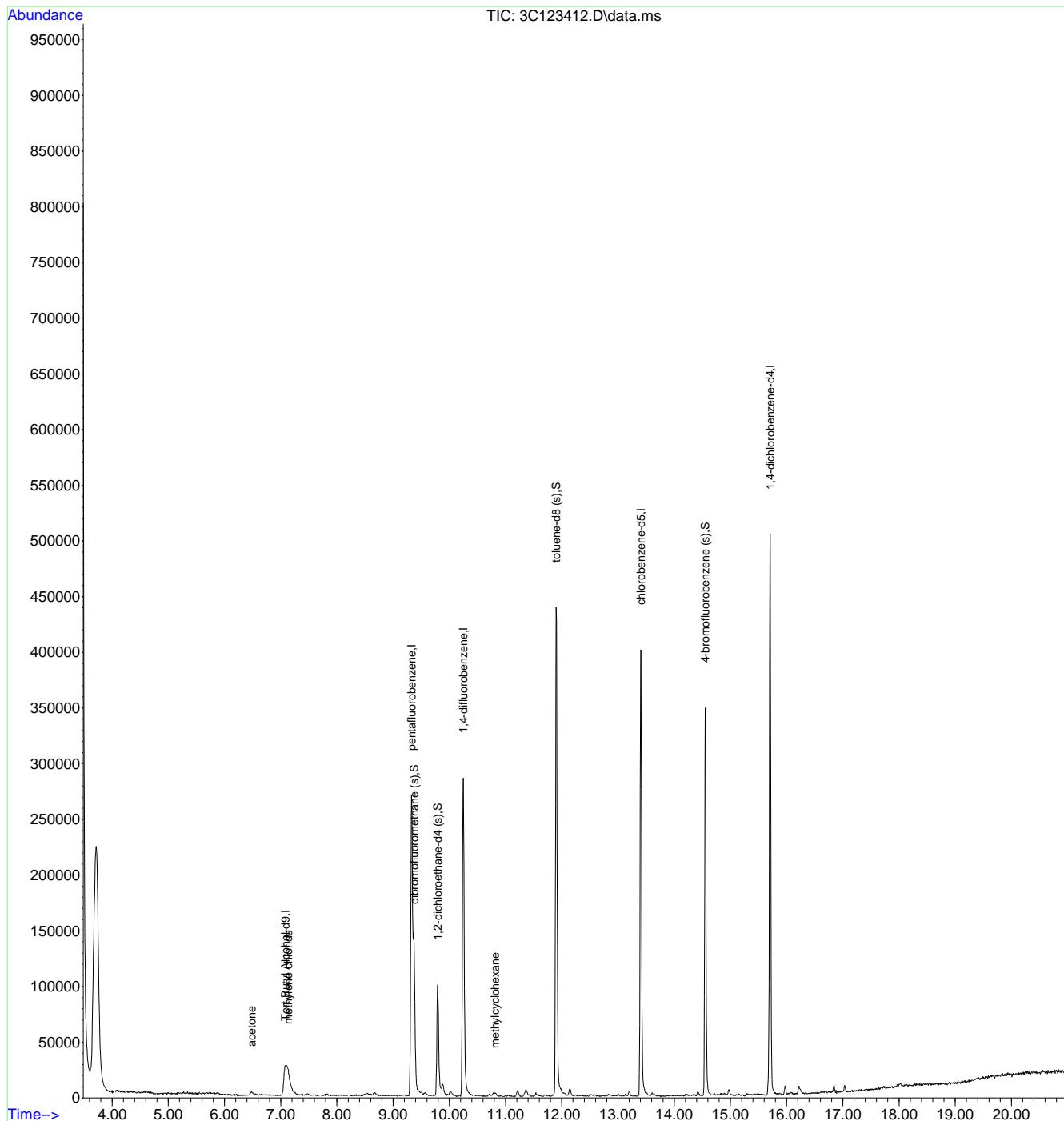
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<b>Internal Standards</b>						
1) Tert Butyl Alcohol-d9	7.083	65	104160	500.00	ug/L	0.00
5) pentafluorobenzene	9.327	168	236918	50.00	ug/L	-0.01
55) 1,4-difluorobenzene	10.248	114	278823	50.00	ug/L	0.00
84) chlorobenzene-d5	13.407	117	233875	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	15.708	152	130507	50.00	ug/L	0.00
<b>System Monitoring Compounds</b>						
46) dibromofluoromethane (s)	9.374	113	85065	47.25	ug/L	0.00
Spiked Amount 50.000	Range 70 - 122		Recovery =	94.50%		
47) 1,2-dichloroethane-d4 (s)	9.793	65	84934	49.69	ug/L	0.00
Spiked Amount 50.000	Range 68 - 124		Recovery =	99.38%		
76) toluene-d8 (s)	11.900	98	326568	49.86	ug/L	0.00
Spiked Amount 50.000	Range 77 - 125		Recovery =	99.72%		
102) 4-bromofluorobenzene (s)	14.552	95	117148	47.62	ug/L	0.00
Spiked Amount 50.000	Range 72 - 130		Recovery =	95.24%		
<b>Target Compounds</b>						
20) acetone	6.482	43	10612	16.63	ug/L	77
26) methylene chloride	7.130	84	1858	0.83	ug/L #	63
72) methylcyclohexane	10.813	83	1327	0.32	ug/L	79

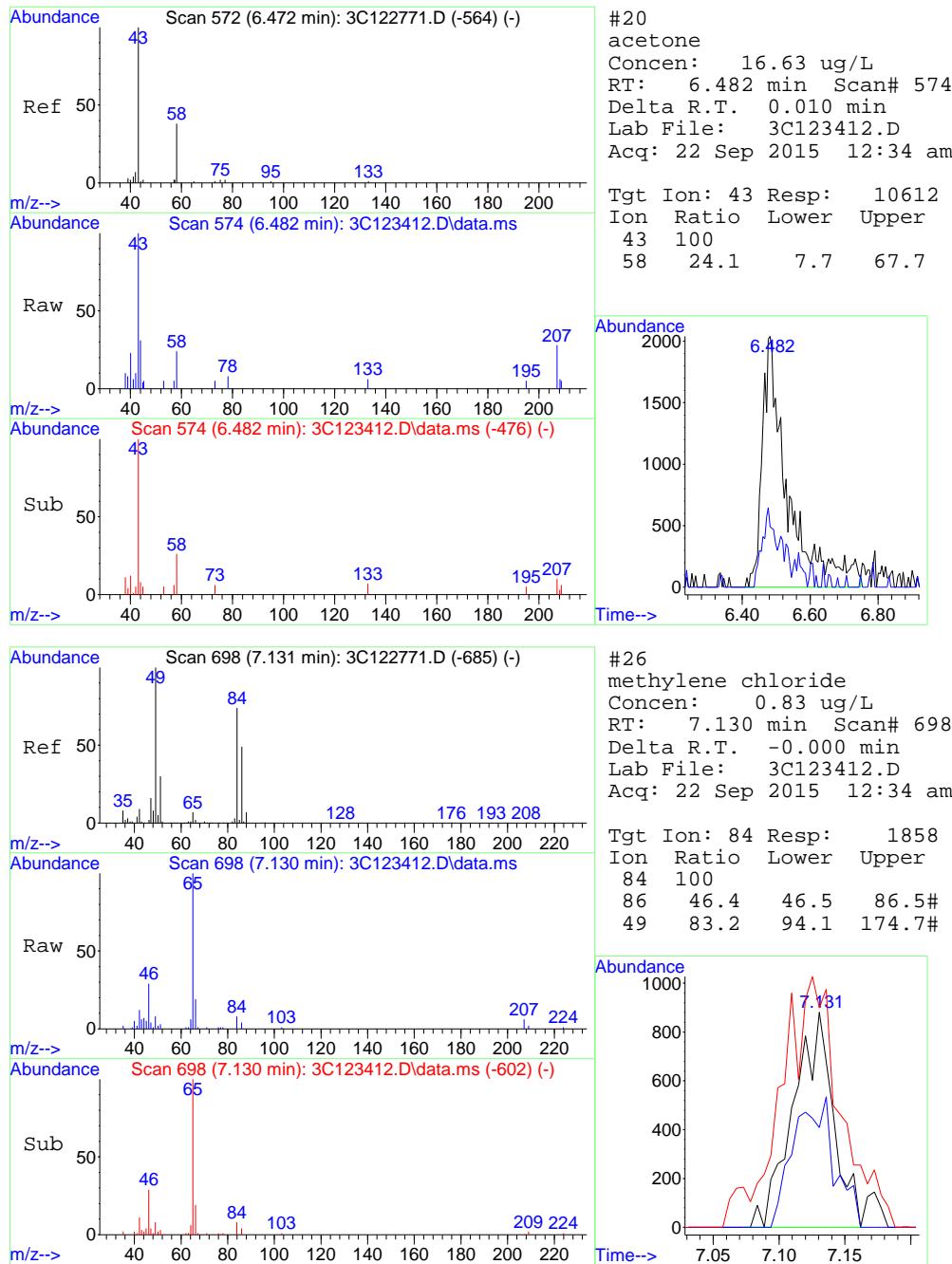
(#) = qualifier out of range (m) = manual integration (+) = signals summed

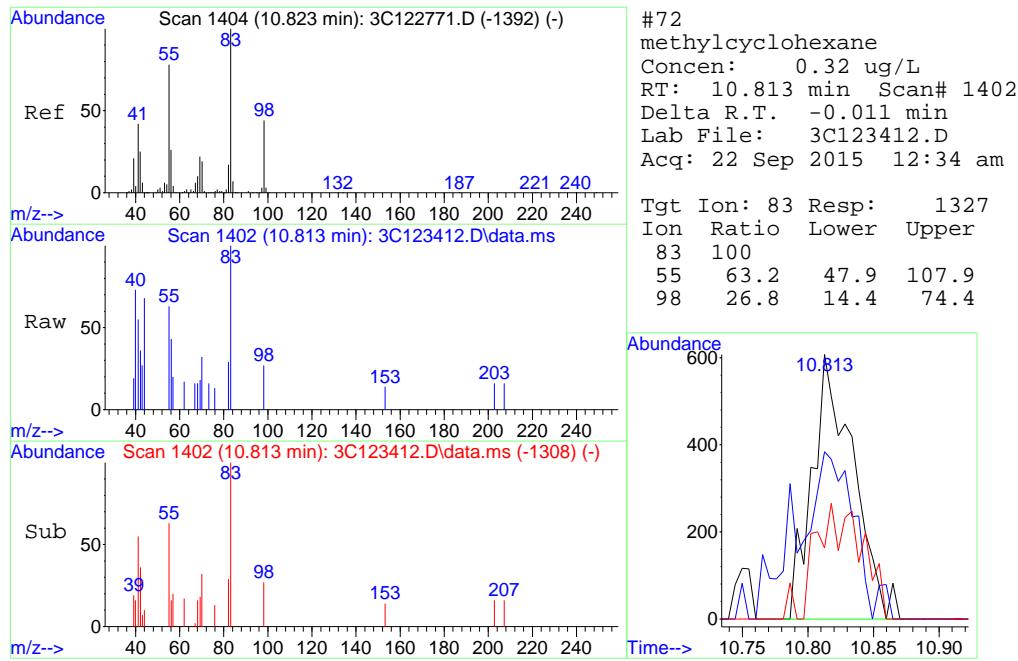
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123412.D  
 Acq On : 22 Sep 2015 12:34 am  
 Operator : PrashanS  
 Sample : JC4006-4  
 Misc : MS91359,V3C5637,4.4,,,1  
 ALS Vial : 23 Sample Multiplier: 1

Quant Time: Sep 22 11:16:22 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration







## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123395.D  
 Acq On : 21 Sep 2015 4:15 pm  
 Operator : PrashanS  
 Sample : MB  
 Misc : MS91148,V3C5637,5.0,,,1  
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 22 11:01:18 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
<b>Internal Standards</b>						
1) Tert Butyl Alcohol-d9	7.099	65	89389	500.00	ug/L	0.01
5) pentafluorobenzene	9.332	168	234057	50.00	ug/L	0.00
55) 1,4-difluorobenzene	10.248	114	267364	50.00	ug/L	0.00
84) chlorobenzene-d5	13.407	117	213955	50.00	ug/L	0.00
100) 1,4-dichlorobenzene-d4	15.708	152	121180	50.00	ug/L	0.00
<b>System Monitoring Compounds</b>						
46) dibromofluoromethane (s)	9.369	113	81142	45.62	ug/L	-0.01
Spiked Amount 50.000	Range 70 - 122		Recovery =	91.24%		
47) 1,2-dichloroethane-d4 (s)	9.793	65	79951	47.34	ug/L	0.00
Spiked Amount 50.000	Range 68 - 124		Recovery =	94.68%		
76) toluene-d8 (s)	11.900	98	307323	48.93	ug/L	0.00
Spiked Amount 50.000	Range 77 - 125		Recovery =	97.86%		
102) 4-bromofluorobenzene (s)	14.552	95	106442	46.60	ug/L	0.00
Spiked Amount 50.000	Range 72 - 130		Recovery =	93.20%		

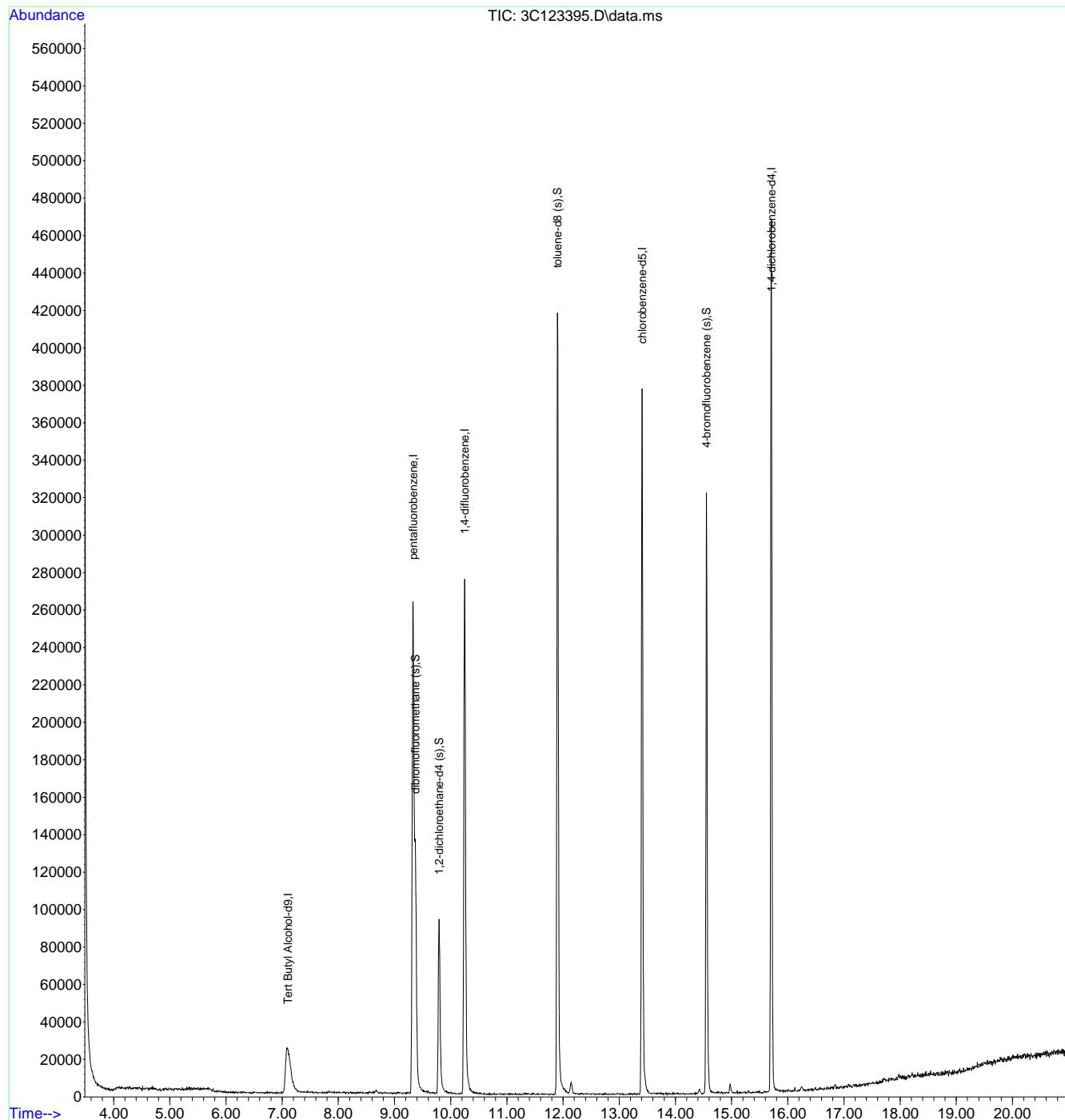
Target Compounds	Qvalue
------------------	--------

(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\3C\V3C5637\  
 Data File : 3C123395.D  
 Acq On : 21 Sep 2015 4:15 pm  
 Operator : PrashanS  
 Sample : MB  
 Misc : MS91148,V3C5637,5.0,,,1  
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 22 11:01:18 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M3C5608.M  
 Quant Title : Method SW846 8260C, ZB624 60m x 0.25mm x 1.4um  
 QLast Update : Tue Sep 01 13:33:40 2015  
 Response via : Initial Calibration



M3C5608.M Tue Sep 22 11:16:45 2015 T

Page: 2



## GC/MS Semi-volatiles

### QC Data Summaries

∞

---

**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (DFTPP)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

**Method Blank Summary**

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-MB1	2M77577.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	170	61	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	170	150	ug/kg	
95-48-7	2-Methylphenol	ND	67	48	ug/kg	
	3&4-Methylphenol	ND	67	32	ug/kg	
100-02-7	4-Nitrophenol	ND	330	57	ug/kg	
108-95-2	Phenol	ND	67	25	ug/kg	
83-32-9	Acenaphthene	ND	33	31	ug/kg	
120-12-7	Anthracene	ND	33	2.9	ug/kg	
56-55-3	Benzo(a)anthracene	ND	33	6.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	33	7.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	33	6.9	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	33	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	33	7.4	ug/kg	
92-52-4	1,1'-Biphenyl	ND	67	6.2	ug/kg	
218-01-9	Chrysene	ND	33	5.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	33	12	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	67	3.9	ug/kg	
84-66-2	Diethyl phthalate	ND	67	4.2	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	67	12	ug/kg	
206-44-0	Fluoranthene	ND	33	4.1	ug/kg	
86-73-7	Fluorene	ND	33	4.0	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	33	17	ug/kg	
91-57-6	2-Methylnaphthalene	ND	67	6.2	ug/kg	
91-20-3	Naphthalene	ND	33	5.3	ug/kg	
85-01-8	Phenanthrene	ND	33	3.7	ug/kg	
129-00-0	Pyrene	ND	33	4.2	ug/kg	
110-86-1	Pyridine	ND	67	17	ug/kg	
91-22-5	Quinoline	ND	170	12	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	79% 30-106%
4165-62-2	Phenol-d5	75% 30-106%
118-79-6	2,4,6-Tribromophenol	73% 24-140%
4165-60-0	Nitrobenzene-d5	70% 26-122%

## Method Blank Summary

Page 2 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-MB1	2M77577.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	87%      36-112%
1718-51-0	Terphenyl-d14	87%      36-132%

8.1.1  
8

## Blank Spike Summary

Page 1 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-BS1	2M77578.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
105-67-9	2,4-Dimethylphenol	1670	1230	74	49-115
51-28-5	2,4-Dinitrophenol	3330	2370	71	30-127
95-48-7	2-Methylphenol	1670	1330	80	53-103
	3&4-Methylphenol	1670	1210	73	53-102
100-02-7	4-Nitrophenol	1670	1000	60	36-143
108-95-2	Phenol	1670	1250	75	45-106
83-32-9	Acenaphthene	1670	1520	91	60-108
120-12-7	Anthracene	1670	1500	90	59-109
56-55-3	Benzo(a)anthracene	1670	1290	77	52-113
50-32-8	Benzo(a)pyrene	1670	1550	93	56-122
205-99-2	Benzo(b)fluoranthene	1670	1430	86	53-119
191-24-2	Benzo(g,h,i)perylene	1670	1370	82	48-117
207-08-9	Benzo(k)fluoranthene	1670	1510	91	52-115
92-52-4	1,1'-Biphenyl	1670	1350	81	54-101
218-01-9	Chrysene	1670	1430	86	51-119
53-70-3	Dibenzo(a,h)anthracene	1670	1500	90	49-118
84-74-2	Di-n-butyl phthalate	1670	1350	81	56-117
84-66-2	Diethyl phthalate	1670	1300	78	54-112
117-81-7	bis(2-Ethylhexyl)phthalate	1670	1310	79	45-130
206-44-0	Fluoranthene	1670	1460	88	58-110
86-73-7	Fluorene	1670	1420	85	59-108
193-39-5	Indeno(1,2,3-cd)pyrene	1670	1460	88	48-120
91-57-6	2-Methylnaphthalene	1670	1380	83	48-104
91-20-3	Naphthalene	1670	1230	74	49-100
85-01-8	Phenanthrene	1670	1460	88	57-105
129-00-0	Pyrene	1670	1350	81	50-117
110-86-1	Pyridine	1670	964	58	26-110
91-22-5	Quinoline	1670	1290	77	51-102

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	80%	30-106%
4165-62-2	Phenol-d5	77%	30-106%
118-79-6	2,4,6-Tribromophenol	83%	24-140%
4165-60-0	Nitrobenzene-d5	71%	26-122%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-BS1	2M77578.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Surrogate Recoveries	BSP	Limits
321-60-8	2-Fluorobiphenyl	88%	36-112%
1718-51-0	Terphenyl-d14	94%	36-132%

8.2.1  
8

---

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-MS	2M77593.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372
OP87306-MSD	2M77594.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372
JC3938-1	2M77579.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	JC3938-1		Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q								
105-67-9	2,4-Dimethylphenol	ND	1730	1090	63	1730	912	53	18	23-133/34	
51-28-5	2,4-Dinitrophenol	ND	3470	1360	39	3470	1320	38	3	10-110/51	
95-48-7	2-Methylphenol	ND	1730	1320	76	1730	1180	68	11	32-111/34	
	3&4-Methylphenol	ND	1730	1240	72	1730	1120	65	10	32-113/34	
100-02-7	4-Nitrophenol	ND	1730	1030	59	1730	910	53	12	14-154/39	
108-95-2	Phenol	ND	1730	1270	73	1730	1140	66	11	25-112/33	
83-32-9	Acenaphthene	ND	1730	1500	87	1730	1340	77	11	34-125/36	
120-12-7	Anthracene	ND	1730	1520	88	1730	1300	75	16	31-131/41	
56-55-3	Benzo(a)anthracene	ND	1730	1330	77	1730	1140	66	15	23-136/43	
50-32-8	Benzo(a)pyrene	ND	1730	1480	85	1730	1300	75	13	22-144/42	
205-99-2	Benzo(b)fluoranthene	ND	1730	1340	77	1730	1170	68	14	18-145/43	
191-24-2	Benzo(g,h,i)perylene	ND	1730	1450	84	1730	1260	73	14	20-138/43	
207-08-9	Benzo(k)fluoranthene	ND	1730	1450	84	1730	1220	70	17	27-129/43	
92-52-4	1,1'-Biphenyl	ND	1730	1340	77	1730	1180	68	13	33-116/32	
218-01-9	Chrysene	ND	1730	1450	84	1730	1250	72	15	21-142/43	
53-70-3	Dibenzo(a,h)anthracene	ND	1730	1540	89	1730	1360	78	12	25-135/41	
84-74-2	Di-n-butyl phthalate	ND	1730	1370	79	1730	1160	67	17	32-131/34	
84-66-2	Diethyl phthalate	ND	1730	1310	76	1730	1110	64	17	35-124/32	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	1730	1350	78	1730	1110	64	20	25-146/35	
206-44-0	Fluoranthene	ND	1730	1400	81	1730	1230	71	13	15-143/46	
86-73-7	Fluorene	ND	1730	1370	79	1730	1200	69	13	30-129/37	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1730	1460	84	1730	1280	74	13	23-141/44	
91-57-6	2-Methylnaphthalene	ND	1730	1370	79	1730	1120	65	20	21-125/33	
91-20-3	Naphthalene	ND	1730	1290	74	1730	1060	61	20	24-118/35	
85-01-8	Phenanthrene	ND	1730	1470	85	1730	1240	72	17	14-144/44	
129-00-0	Pyrene	ND	1730	1440	83	1730	1180	68	20	16-147/46	
110-86-1	Pyridine	ND	1730	1070	62	1730	1030	59	4	10-110/43	
91-22-5	Quinoline	ND	1730	1270	73	1730	1070	62	17	26-116/32	

CAS No.	Surrogate Recoveries	MS	MSD	JC3938-1	Limits
367-12-4	2-Fluorophenol	80%	73%		30-106%
4165-62-2	Phenol-d5	76%	68%		30-106%
118-79-6	2,4,6-Tribromophenol	78%	70%		24-140%
4165-60-0	Nitrobenzene-d5	69%	57%	65%	26-122%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP87306-MS	2M77593.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372
OP87306-MSD	2M77594.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372
JC3938-1	2M77579.D	1	09/18/15	AN	09/18/15	OP87306	E2M3372

The QC reported here applies to the following samples:

Method: SW846 8270D

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Surrogate Recoveries	MS	MSD	JC3938-1	Limits
321-60-8	2-Fluorobiphenyl	82%	74%	80%	36-112%
1718-51-0	Terphenyl-d14	94%	77%	78%	36-132%

8.3.1  
8

---

\* = Outside of Control Limits.

# Instrument Performance Check (DFTPP)

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	E2M3346-DFTPP	Injection Date:	08/29/15
Lab File ID:	2M77099.D	Injection Time:	12:49
Instrument ID:	GCMS2M		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	325531	47.8	Pass
68	Less than 2.0% of mass 69	5114	0.75	(1.54) <sup>a</sup> Pass
69	Mass 69 relative abundance	331459	48.7	Pass
70	Less than 2.0% of mass 69	857	0.13	(0.26) <sup>a</sup> Pass
127	40.0 - 60.0% of mass 198	403925	59.4	Pass
197	Less than 1.0% of mass 198	3418	0.50	Pass
198	Base peak, 100% relative abundance	680352	100.0	Pass
199	5.0 - 9.0% of mass 198	47370	6.96	Pass
275	10.0 - 30.0% of mass 198	153226	22.5	Pass
365	1.0 - 100.0% of mass 198	18000	2.65	Pass
441	Present, but less than mass 443	76350	11.2	(73.1) <sup>b</sup> Pass
442	40.0 - 100.0% of mass 198	556504	81.8	Pass
443	17.0 - 23.0% of mass 442	104490	15.4	(18.8) <sup>c</sup> Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E2M3346-IC3346	2M77100.D	08/29/15	13:10	00:21	Initial cal 2
E2M3346-IC3346	2M77101.D	08/29/15	13:37	00:48	Initial cal 100
E2M3346-IC3346	2M77102.D	08/29/15	14:04	01:15	Initial cal 1
E2M3346-IC3346	2M77103.D	08/29/15	14:30	01:41	Initial cal 80
E2M3346-IC3346	2M77104.D	08/29/15	14:57	02:08	Initial cal 5
E2M3346-ICC3346	2M77105.D	08/29/15	15:23	02:34	Initial cal 50
E2M3346-IC3346	2M77106.D	08/29/15	15:50	03:01	Initial cal 10
E2M3346-IC3346	2M77107.D	08/29/15	16:16	03:27	Initial cal 25

# Instrument Performance Check (DFTPP)

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	E2M3347-DFTPP	Injection Date:	08/29/15
Lab File ID:	2M77108.D	Injection Time:	17:01
Instrument ID:	GCMS2M		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	304062	45.0	Pass
68	Less than 2.0% of mass 69	4495	0.67	(1.45) <sup>a</sup> Pass
69	Mass 69 relative abundance	309970	45.9	Pass
70	Less than 2.0% of mass 69	1386	0.21	(0.45) <sup>a</sup> Pass
127	40.0 - 60.0% of mass 198	389992	57.7	Pass
197	Less than 1.0% of mass 198	861	0.13	Pass
198	Base peak, 100% relative abundance	675904	100.0	Pass
199	5.0 - 9.0% of mass 198	44690	6.61	Pass
275	10.0 - 30.0% of mass 198	158624	23.5	Pass
365	1.0 - 100.0% of mass 198	22083	3.27	Pass
441	Present, but less than mass 443	93458	13.8	(76.4) <sup>b</sup> Pass
442	40.0 - 100.0% of mass 198	634089	93.8	Pass
443	17.0 - 23.0% of mass 442	122280	18.1	(19.3) <sup>c</sup> Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E2M3347-IC3347	2M77109.D	08/29/15	17:16	00:15	Initial cal 100
E2M3347-IC3347	2M77110.D	08/29/15	17:42	00:41	Initial cal 80
E2M3347-ICC3347	2M77111.D	08/29/15	18:09	01:08	Initial cal 50
E2M3347-IC3347	2M77112.D	08/29/15	18:35	01:34	Initial cal 25
E2M3347-IC3347	2M77113.D	08/29/15	19:02	02:01	Initial cal 10
E2M3347-IC3347	2M77114.D	08/29/15	19:28	02:27	Initial cal 5
E2M3347-IC3347	2M77115.D	08/29/15	19:55	02:54	Initial cal 2
E2M3347-IC3347	2M77116.D	08/29/15	20:21	03:20	Initial cal 1
E2M3347-ICV3346	2M77118.D	08/29/15	21:15	04:14	Initial cal verification 50
E2M3347-ICV3347	2M77119A.D	08/29/15	21:41	04:40	Initial cal verification 50
E2M3347-ICV3346	2M77119.D	08/29/15	21:41	04:40	Initial cal verification 50
E2M3347-ICV3346	2M77120.D	08/29/15	22:08	05:07	Initial cal verification 50
E2M3347-ICV3347	2M77120A.D	08/29/15	22:08	05:07	Initial cal verification 50
E2M3347-ICV3346	2M77121.D	08/29/15	22:34	05:33	Initial cal verification 50
E2M3347-ICV3347	2M77123.D	08/29/15	23:28	06:27	Initial cal verification 50

# Instrument Performance Check (DFTPP)

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	E2M3348-DFTPP	Injection Date:	08/31/15
Lab File ID:	2M77125.D	Injection Time:	09:21
Instrument ID:	GCMS2M		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	111584	46.5	Pass
68	Less than 2.0% of mass 69	1454	0.61	(1.35) <sup>a</sup> Pass
69	Mass 69 relative abundance	107354	44.7	Pass
70	Less than 2.0% of mass 69	684	0.29	(0.64) <sup>a</sup> Pass
127	40.0 - 60.0% of mass 198	137458	57.3	Pass
197	Less than 1.0% of mass 198	1386	0.58	Pass
198	Base peak, 100% relative abundance	239914	100.0	Pass
199	5.0 - 9.0% of mass 198	17236	7.18	Pass
275	10.0 - 30.0% of mass 198	59644	24.9	Pass
365	1.0 - 100.0% of mass 198	7683	3.20	Pass
441	Present, but less than mass 443	30969	12.9	(76.2) <sup>b</sup> Pass
442	40.0 - 100.0% of mass 198	230341	96.0	Pass
443	17.0 - 23.0% of mass 442	40634	16.9	(17.6) <sup>c</sup> Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E2M3348-ICV3346	2M77126.D	08/31/15	09:42	00:21	Initial cal verification 50

# Instrument Performance Check (DFTPP)

Page 1 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	E2M3372-DFTPP	Injection Date:	09/18/15
Lab File ID:	2M77572.D	Injection Time:	10:21
Instrument ID:	GCMS2M		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
51	30.0 - 60.0% of mass 198	94330	40.6	Pass
68	Less than 2.0% of mass 69	813	0.35	(0.70) <sup>a</sup> Pass
69	Mass 69 relative abundance	116625	50.2	Pass
70	Less than 2.0% of mass 69	1583	0.68	(1.36) <sup>a</sup> Pass
127	40.0 - 60.0% of mass 198	120456	51.8	Pass
197	Less than 1.0% of mass 198	439	0.19	Pass
198	Base peak, 100% relative abundance	232413	100.0	Pass
199	5.0 - 9.0% of mass 198	17516	7.54	Pass
275	10.0 - 30.0% of mass 198	65938	28.4	Pass
365	1.0 - 100.0% of mass 198	7767	3.34	Pass
441	Present, but less than mass 443	30803	13.3	(92.1) <sup>b</sup> Pass
442	40.0 - 100.0% of mass 198	186164	80.1	Pass
443	17.0 - 23.0% of mass 442	33452	14.4	(18.0) <sup>c</sup> Pass

(a) Value is % of mass 69

(b) Value is % of mass 443

(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
E2M3372-CC3346	2M77573.D	09/18/15	10:40	00:19	Continuing cal 25
E2M3372-CC3347	2M77574.D	09/18/15	11:10	00:49	Continuing cal 25
OP87306-MB1	2M77577.D	09/18/15	12:31	02:10	Method Blank
OP87306-BS1	2M77578.D	09/18/15	12:57	02:36	Blank Spike
JC3938-1	2M77579.D	09/18/15	13:24	03:03	(used for QC only; not part of job JC4006)
ZZZZZZ	2M77580.D	09/18/15	13:51	03:30	(unrelated sample)
ZZZZZZ	2M77581.D	09/18/15	14:17	03:56	(unrelated sample)
ZZZZZZ	2M77582.D	09/18/15	14:44	04:23	(unrelated sample)
ZZZZZZ	2M77583.D	09/18/15	15:11	04:50	(unrelated sample)
ZZZZZZ	2M77584.D	09/18/15	15:37	05:16	(unrelated sample)
ZZZZZZ	2M77585.D	09/18/15	16:04	05:43	(unrelated sample)
JC4006-1	2M77586.D	09/18/15	16:30	06:09	MHIC-388-8(5.0)
JC4006-2	2M77587.D	09/18/15	16:57	06:36	MHIC-388-9(5.0)
JC4006-4	2M77588.D	09/18/15	17:24	07:03	MHIC-388-11(5.0)
ZZZZZZ	2M77589.D	09/18/15	17:50	07:29	(unrelated sample)
ZZZZZZ	2M77590.D	09/18/15	18:17	07:56	(unrelated sample)
ZZZZZZ	2M77591.D	09/18/15	18:44	08:23	(unrelated sample)
JC4006-3	2M77592.D	09/18/15	19:10	08:49	MHIC-388-10(5.0)
OP87306-MS	2M77593.D	09/18/15	19:37	09:16	Matrix Spike

## Instrument Performance Check (DFTPP)

Page 2 of 2

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Sample:	E2M3372-DFTPP	Injection Date:	09/18/15
Lab File ID:	2M77572.D	Injection Time:	10:21
Instrument ID:	GCMS2M		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
OP87306-MSD	2M77594.D	09/18/15	20:03	09:42	Matrix Spike Duplicate
ZZZZZZ	2M77599.D	09/18/15	20:30	10:09	(unrelated sample)
ZZZZZZ	2M77595.D	09/18/15	20:56	10:35	(unrelated sample)
ZZZZZZ	2M77596.D	09/18/15	21:23	11:02	(unrelated sample)
ZZZZZZ	2M77597.D	09/18/15	21:50	11:29	(unrelated sample)

# Semivolatile Internal Standard Area Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Check Std:	E2M3372-CC3346				Injection Date:		09/18/15			
Lab File ID:	2M77573.D				Injection Time:		10:40			
Instrument ID:	GCMS2M				Method:		SW846 8270D			

	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	IS 6 AREA	
	RT	RT	RT	RT	RT	RT	
Check Std	331480	4.78	1378092	5.89	850125	7.96	1366374
Upper Limit <sup>a</sup>	662960	5.28	2756184	6.39	1700250	8.46	2732748
Lower Limit <sup>b</sup>	165740	4.28	689046	5.39	425063	7.46	683187

Lab Sample ID	IS 1 AREA	IS 2 AREA	IS 3 AREA	IS 4 AREA	IS 5 AREA	IS 6 AREA	
	RT	RT	RT	RT	RT	RT	
OP87306-MB1	516782	4.78	2090085	5.89	1141929	7.96	1759053
OP87306-BS1	421629	4.78	1711622	5.89	969437	7.96	1493602
JC3938-1	508569	4.78	2033530	5.89	1114556	7.96	1766761
ZZZZZZ	531158	4.78	2120823	5.89	1214756	7.96	1879850
ZZZZZZ	437549	4.78	1772775	5.89	988440	7.96	1553118
ZZZZZZ	505058	4.78	1990470	5.88	1117171	7.96	1701371
ZZZZZZ	467683	4.78	1837924	5.88	1032689	7.96	1603236
ZZZZZZ	479545	4.78	1914938	5.89	1057306	7.96	1671320
ZZZZZZ	412560	4.78	1676822	5.88	927710	7.96	1461532
JC4006-1	456427	4.78	1834287	5.88	1008742	7.96	1552529
JC4006-2	434534	4.78	1740046	5.88	967338	7.96	1481545
JC4006-4	477410	4.78	1899514	5.88	1057760	7.96	1649659
ZZZZZZ	435287	4.78	1695975	5.88	942490	7.96	1524897
ZZZZZZ	481385	4.78	1926248	5.88	1074058	7.96	1665622
ZZZZZZ	457737	4.78	1790915	5.89	980187	7.96	1483491
JC4006-3	382923	4.78	1521979	5.89	825492	7.97	1164687
OP87306-MS	422761	4.78	1732314	5.89	987141	7.97	1509406
OP87306-MSD	440613	4.78	1953174	5.89	1023252	7.97	1565464
ZZZZZZ	412643	4.78	1613794	5.89	969630	7.96	1529854
ZZZZZZ	437303	4.78	1687244	5.89	911851	7.97	1361019
ZZZZZZ	387811	4.78	1583414	5.89	953374	7.98	1447428
ZZZZZZ	361688	4.78	1468074	5.90	871924	7.99	1344126

IS 1 = 1,4-Dichlorobenzene-d4

IS 2 = Naphthalene-d8

IS 3 = Acenaphthene-D10

IS 4 = Phenanthrene-d10

IS 5 = Chrysene-d12

IS 6 = Perylene-d12

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Semivolatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

Method: SW846 8270D

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JC4006-1	2M77586.D	68	63	63	58	73	75
JC4006-2	2M77587.D	66	61	68	60	74	80
JC4006-3	2M77592.D	59	59	61	52	69	67
JC4006-4	2M77588.D	68	63	64	62	76	77
OP87306-BS1	2M77578.D	80	77	83	71	88	94
OP87306-MB1	2M77577.D	79	75	73	70	87	87
OP87306-MS	2M77593.D	80	76	78	69	82	94
OP87306-MSD	2M77594.D	73	68	70	57	74	77

Surrogate  
Compounds

Recovery  
Limits

S1 = 2-Fluorophenol	30-106%
S2 = Phenol-d5	30-106%
S3 = 2,4,6-Tribromophenol	24-140%
S4 = Nitrobenzene-d5	26-122%
S5 = 2-Fluorobiphenyl	36-112%
S6 = Terphenyl-d14	36-132%

## Initial Calibration Summary

Job Number: JC4006

Sample: E2M3346-ICC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77105.D

Project: Sunoco - Marcus Hook Facility, PA

## Response Factor Report MS

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)

Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um

Last Update : Sat Aug 29 16:57:03 2015

Response via : Initial Calibration

## Calibration Files

2 =2m77100.D	5 =2m77104.D	25 =2m77107.D	80 =2m77103.D
100 =2m77101.D	50 =2m77105.D	1 =2m77102.D	10 =2m77106.D

Compound	2	5	25	80	100	50	1	10	Avg	%RSD
<hr/>										
1) I 1,4-Dichlorobenzene-d							-----ISTD-----			
2) 1,4-Dioxane	0.653	0.642	0.669	0.639	0.632	0.634	0.735	0.582	0.648	6.64
3) Pyridine	1.462	1.530	1.623	1.569	1.577	1.565	1.408	1.525	1.532	4.48
4) N-Nitrosodim	0.832	0.927	0.967	0.922	0.926	0.923	0.992	0.857	0.918	5.71
5) 2-Fluorophen	1.251	1.320	1.499	1.484	1.561	1.461	1.356	1.306	1.405	7.87
6) Indene	2.584	2.885	3.077	3.203	3.492	3.093	2.723	2.853	2.989	9.64
7) Cumene	4.035	4.122	4.554	4.618	4.938	4.499	4.123	4.017	4.363	7.72
8) Phenol-d5	1.643	1.838	1.992	1.965	2.043	1.926	1.606	1.828	1.855	8.62
9) Phenol	1.941	1.972	2.332	2.353	2.440	2.304	1.905	1.952	2.150	10.50
10) Aniline	2.101	2.386	2.388	2.191	2.236	2.134	2.484	2.308	2.278	5.95
11) bis(2-Chloro	1.404	1.377	1.484	1.471	1.516	1.453	1.479	1.285	1.434	5.23
12) 2-Chlorophen	1.540	1.432	1.565	1.558	1.642	1.535	1.544	1.436	1.531	4.50
13) Decane	2.002	2.019	2.189	1.972	1.959	1.990	2.023	1.982	2.017	3.62
14) 1,3-Dichlоро	1.606	1.586	1.609	1.599	1.650	1.578	1.439	1.505	1.572	4.29
15) 1,4-Dichlоро	1.455	1.592	1.731	1.668	1.723	1.633	1.626	1.526	1.619	5.83
16) Benzyl alcoh	0.919	1.003	1.063	1.038	1.108	1.008	0.953	0.922	1.002	6.74
17) 1,2-Dichlоро	1.362	1.476	1.552	1.528	1.604	1.525	1.399	1.420	1.483	5.64
18) Acetophenone	2.302	2.455	2.539	2.561	2.744	2.520	2.225	2.333	2.460	6.82
19) 2-Methylphen	1.383	1.313	1.451	1.427	1.475	1.398	1.326	1.325	1.387	4.44
20) 2,2'-oxybis(	2.396	2.427	2.604	2.411	2.396	2.431	2.495	2.304	2.433	3.57
21) 3&4-Methylph	1.433	1.403	1.601	1.650	1.772	1.619	1.496	1.437	1.551	8.36
22) n-Nitroso-di	1.105	1.118	1.248	1.251	1.274	1.220	1.229	1.078	1.190	6.46
23) Hexachloroet	0.569	0.558	0.577	0.546	0.551	0.546	0.558	0.486	0.549	5.02
24) I Naphthalene-d8							-----ISTD-----			
25) Nitrobenzene	0.411	0.444	0.491	0.464	0.476	0.457	0.441	0.422	0.451	5.95
26) Nitrobenzene	0.420	0.462	0.501	0.483	0.493	0.478	0.467	0.426	0.466	6.36
27) Quinoline	0.664	0.738	0.788	0.767	0.780	0.746	0.765	0.685	0.742	6.03
28) Isophorone	0.756	0.774	0.873	0.841	0.857	0.824	0.817	0.731	0.809	6.24
29) 2-Nitropheno	0.180	0.176	0.210	0.207	0.213	0.205	0.180	0.175	0.193	8.71
30) 2,4-Dimethyl	0.345	0.386	0.447	0.467	0.477	0.445	0.375	0.415	0.420	11.26
31) Benzoic acid	0.196	0.278	0.315	0.305	0.288		0.208	0.265	19.06	
32) bis(2-Chloro	0.386	0.428	0.458	0.456	0.465	0.447	0.431	0.390	0.433	7.01
33) 2,4-Dichlоро	0.250	0.289	0.310	0.304	0.313	0.295	0.266	0.263	0.286	8.27
34) 2,6-Dichlоро	0.265	0.269	0.302	0.303	0.310	0.293	0.312	0.261	0.289	7.34
35) 1,3,5-Trichl	0.316	0.336	0.367	0.358	0.378	0.352	0.338	0.319	0.345	6.41
36) 1,2,4-Trichl	0.290	0.305	0.338	0.333	0.336	0.330	0.333	0.294	0.320	6.22
37) 1,2,3-Trichl	0.266	0.303	0.343	0.325	0.341	0.319	0.305	0.298	0.313	8.09
38) Naphthalene	1.003	1.092	1.189	1.215	1.278	1.163	1.130	1.024	1.137	8.28
39) 4-Chloroanil	0.388	0.441	0.488	0.471	0.486	0.447	0.474	0.408	0.450	8.17
40) 2,3-Dichlоро	0.307	0.375	0.383	0.398	0.415	0.379	0.355	0.344	0.369	9.08
41) Caprolactam	0.178	0.206	0.229	0.213	0.214	0.212	0.219	0.193	0.208	7.59
42) Hexachlororobu	0.168	0.187	0.209	0.195	0.200	0.192	0.182	0.180	0.189	6.81
43) 4-Chloro-3-m	0.340	0.389	0.407	0.410	0.415	0.406	0.323	0.352	0.380	9.56
44) 2-Methylnaph	0.539	0.585	0.613	0.613	0.653	0.603	0.535	0.512	0.582	8.31
45) 1-Methylnaph	0.575	0.621	0.652	0.644	0.686	0.629	0.579	0.568	0.619	6.80

## Initial Calibration Summary

Page 2 of 3

Job Number: JC4006

Sample: E2M3346-ICC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77105.D

Project: Sunoco - Marcus Hook Facility, PA

46)	Dimethylnaph	0.590	0.655	0.707	0.717	0.753	0.690	0.610	0.611	0.667	8.86
47)	I Acenaphthene-d10							-----	ISTD-----		
48)	Hexachlorocyclo	0.297	0.355	0.396	0.387	0.421	0.380	0.301	0.322	0.357	12.96
49)	2,4,6-Trichloro	0.332	0.334	0.392	0.377	0.409	0.374	0.305	0.336	0.357	10.06
50)	2,4,5-Trichloro	0.331	0.365	0.378	0.366	0.395	0.355	0.273	0.324	0.348	11.00
51)	2-Fluorobiphenyl	1.226	1.269	1.294	1.245	1.371	1.248	1.232	1.129	1.252	5.42
52)	2-Chloronaphthalene	1.119	1.122	1.212	1.128	1.207	1.110	1.133	1.025	1.132	5.20
53)	Biphenyl	1.435	1.504	1.604	1.560	1.716	1.530	1.543	1.409	1.538	6.26
54)	2-Nitroaniline	0.424	0.458	0.507	0.462	0.488	0.473	0.399	0.425	0.454	7.93
55)	Dimethylphthalate	1.221	1.344	1.403	1.316	1.414	1.311	1.303	1.172	1.310	6.30
56)	Acenaphthylene	1.722	1.900	1.927	1.896	2.027	1.861	1.815	1.655	1.851	6.39
57)	2,6-Dinitrotoluene	0.266	0.267	0.309	0.283	0.300	0.288	0.234	0.258	0.276	8.75
58)	3-Nitroaniline	0.281	0.332	0.336	0.320	0.346	0.326	0.300	0.301	0.318	6.85
59)	Acenaphthene	1.058	1.105	1.188	1.129	1.213	1.115	1.059	0.993	1.107	6.48
60)	2,4-Dinitrotoluene	0.044	0.087	0.149	0.183	0.204	0.170		0.081	0.131	46.06
	----- Quadratic regression -----							Coefficient =	0.9989		
	Response Ratio = -0.01507 + 0.13760 *A + 0.01350 *A^2										
61)	4-Nitrophenoxy	0.213	0.288	0.343	0.330	0.344	0.322	0.236	0.259	0.292	17.41
62)	Dibenzofuran	1.480	1.609	1.741	1.716	1.894	1.685	1.681	1.410	1.652	9.23
63)	2,4-Dinitrotoluene	0.328	0.390	0.434	0.437	0.477	0.423	0.342	0.349	0.397	13.55
64)	2,3,4,6-Tetrahydrophthalic anhydride	0.274	0.278	0.330	0.333	0.359	0.319	0.234	0.278	0.301	13.63
65)	Diethylphthalate	1.352	1.457	1.535	1.525	1.641	1.483	1.315	1.250	1.445	9.01
66)	Fluorene	1.158	1.325	1.432	1.412	1.579	1.369	1.287	1.209	1.346	9.91
67)	4-Chlorophenol	0.598	0.610	0.665	0.636	0.700	0.631	0.637	0.526	0.626	8.18
68)	4-Nitroaniline	0.321	0.356	0.395	0.334	0.351	0.334	0.283	0.305	0.335	10.17
69)	I Phenanthrene-d10							-----	ISTD-----		
70)	4,6-Dinitrotoluene	0.053	0.099	0.133	0.148	0.164	0.146		0.088	0.119	33.56
	----- Quadratic regression -----							Coefficient =	0.9985		
	Response Ratio = -0.00437 + 0.12494 *A + 0.01544 *A^2										
71)	n-Nitrosodiphenylamine	0.455	0.530	0.585	0.568	0.616	0.574	0.477	0.514	0.540	10.30
72)	1,2-Diphenyl	0.893	0.954	1.022	0.981	1.071	1.010	0.934	0.897	0.970	6.44
73)	2,4,6-Triphenyl	0.123	0.143	0.155	0.154	0.168	0.157	0.124	0.135	0.145	11.34
74)	4-Bromophenol	0.205	0.221	0.244	0.235	0.253	0.240	0.217	0.201	0.227	8.23
75)	Hexachlorobenzene	0.279	0.291	0.302	0.286	0.310	0.293	0.269	0.258	0.286	5.87
76)	Pentachlorophenol	0.126	0.149	0.185	0.195	0.212	0.194		0.145	0.172	18.52
77)	Phenanthrene	1.056	1.084	1.156	1.127	1.247	1.139	1.134	1.022	1.121	6.12
78)	Anthracene	0.989	1.095	1.173	1.125	1.249	1.136	1.112	1.049	1.116	6.98
79)	Carbazole	0.959	1.040	1.099	1.089	1.188	1.089	0.989	0.982	1.054	7.27
80)	Di-n-butylphthalate	1.303	1.447	1.560	1.569	1.734	1.550	1.323	1.297	1.473	10.70
81)	Fluoranthene	1.121	1.179	1.264	1.270	1.369	1.279	1.143	1.076	1.213	8.13
82)	Octadecane	0.718	0.764	0.819	0.757	0.799	0.769	0.665	0.724	0.752	6.46
83)	I Chrysene-d12							-----	ISTD-----		
84)	Pyrene	1.201	1.274	1.392	1.380	1.412	1.338	1.267	1.142	1.301	7.43
85)	Terphenyl-d1	0.801	0.838	0.932	0.921	0.937	0.895	0.889	0.756	0.871	7.60
86)	Butylbenzylphthalate	0.632	0.660	0.723	0.717	0.719	0.685	0.661	0.574	0.671	7.68
87)	Butyl stearate	0.443	0.465	0.512	0.483	0.487	0.470	0.427	0.439	0.466	6.08
88)	Benzo[a]anthracene	1.237	1.203	1.233	1.272	1.310	1.206	1.451	1.056	1.246	8.93
89)	3,3'-Dichlorobiphenyl	0.391	0.417	0.492	0.495	0.513	0.476	0.415	0.411	0.451	10.48
90)	Chrysene	1.061	1.058	1.092	1.074	1.081	1.033	1.180	0.978	1.070	5.31
91)	bis(2-Ethylhexylphthalate)	0.801	0.827	0.897	0.880	0.912	0.861	0.834	0.741	0.844	6.59
92)	I Perylene-d12							-----	ISTD-----		
93)	Di-n-octylphthalate	1.364	1.476	1.549	1.729	1.850	1.556	1.372	1.233	1.516	13.30
94)	Benzo[b]fluoranthene	1.213	1.207	1.239	1.434	1.467	1.240	1.314	1.069	1.273	10.16
95)	Benzo[k]fluoranthene	1.070	1.106	1.122	1.210	1.272	1.117	1.100	0.972	1.121	7.99

8

## Initial Calibration Summary

Page 3 of 3

Job Number: JC4006

Sample: E2M3346-ICC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77105.D

Project: Sunoco - Marcus Hook Facility, PA

---

96)	Benzo[a]pyre	0.956	1.047	1.038	1.144	1.183	1.040	1.060	0.906	1.047	8.56
97)	Indeno[1,2,3]	0.985	1.041	1.171	1.270	1.298	1.127	1.048	0.915	1.107	12.18
98)	Dibenz(a,h)a	0.849	0.947	0.995	1.123	1.151	1.025	0.901	0.866	0.982	11.50
99)	Dibenz[a,h]a	1.024	1.082	1.091	1.204	1.231	1.105	0.964	0.948	1.081	9.46
100)	7,12-Dimethy	0.367	0.450	0.539	0.640		0.575		0.489	0.510	18.90
101)	Benzo[g,h,i]	1.053	1.064	1.070	1.146	1.164	1.069	1.040	0.957	1.070	5.97

---

(#) = Out of Range    ###    Number of calibration levels exceeded format    ###

M2M3346.M

Mon Aug 31 09:06:54 2015

**Initial Calibration Summary**

Job Number: JC4006

Sample: E2M3347-ICC3347

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77111.D

Project: Sunoco - Marcus Hook Facility, PA

## Response Factor Report MS

Method : C:\MSDCHEM\1\METHODS\M2M3346eph.M (RTE Integrator)

Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um

Last Update : Mon Aug 31 13:44:53 2015

Response via : Initial Calibration

## Calibration Files

2	=2m77115a.D	5	=2m77114a.D	25	=2m77112a.D	80	=2m77110a.D
100	=2m77109a.D	50	=2m77111a.D	1	=2m77116a.D	10	=2m77113a.D

Compound	2	5	25	80	100	50	1	10	Avg	%RSD
<hr/>										
102) 1,4-Dichlorobenzene-d							-----ISTD-----			
103) Benzaldehyde	1.140	1.225	1.221	1.262	1.255	1.242	1.414	1.248	1.251	6.10
104) Acenaphthene-d10a							-----ISTD-----			
105) 1,2,4,5-Tetr	0.481	0.497	0.512	0.544	0.547	0.527	0.506	0.480	0.512	5.08
106) Chrysene-d12a							-----ISTD-----			
107) Benzidine	0.578	0.682	0.713	0.549	0.535	0.669	0.531	0.662	0.615	12.05
108) 1-chloroocta	0.422	0.465	0.483	0.531	0.517	0.512	0.421	0.462	0.477	8.76
109) Phenanthrene-d10a							-----ISTD-----			
110) Atrazine	0.082	0.101	0.104	0.111	0.112	0.107	0.104	0.107	0.103	9.11
111) o-terphenyl	0.474	0.531	0.535	0.582	0.593	0.564	0.506	0.533	0.540	7.28
112) Naphthalene-d8a							-----ISTD-----			
113) Hydroquinone		0.269	0.329	0.358	0.367	0.357		0.307	0.331	11.40
<hr/>										
(#)	= Out of Range	###	Number of calibration levels exceeded format	###						

M2M3346eph.M                   Mon Aug 31 13:45:07 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77118.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\e2m3347\2m77118.D Vial: 19  
 Acq On : 29 Aug 2015 9:15 pm Operator: kristis  
 Sample : icv3346-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Sat Aug 29 16:57:03 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
<hr/>						
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	87	0.00
3 t	Pyridine	1.532	1.702	-11.1	95	0.12
10	Aniline	2.278	2.600	-14.1	106	0.00
16 t	Benzyl alcohol	1.002	1.110	-10.8	96	0.00
24 I	Naphthalene-d8	1.000	1.000	0.0	99	0.00
39 t	4-Chloroaniline	0.450	0.417	7.3	92	0.00
44 t	2-Methylnaphthalene	0.582	0.548	5.8	90	0.00
47 I	Acenaphthene-d10	1.000	1.000	0.0	98	0.00
54 t	2-Nitroaniline	0.454	0.415	8.6	86	0.00
58 t	3-Nitroaniline	0.318	0.272	14.5	82	0.00
62 t	Dibenzofuran	1.652	1.457	11.8	85	0.00
68 t	4-Nitroaniline	0.335	0.253	24.5	74	-0.01
69 I	Phenanthrene-d10	1.000	1.000	0.0	106	0.00
79 t	Carbazole	1.054	0.849	19.4	83	0.00
<hr/>						

(#) = Out of Range  
 2m77105.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 08:39:51 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 2M77119.D

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3347\2m77119.D Vial: 20  
 Acq On : 29 Aug 2015 9:41 pm Operator: kristis  
 Sample : icv3346-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	98	0.00	4.91
4 t	N-Nitrosodimethylamine	0.918	0.780	15.0	82	0.02	2.78
11 t	bis(2-Chloroethyl)ether	1.434	1.454	-1.4	98	0.00	4.70
14 t	1,3-Dichlorobenzene	1.572	1.520	3.3	94	0.00	4.87
15 t	1,4-Dichlorobenzene	1.619	1.555	4.0	93	0.00	4.93
17 t	1,2-Dichlorobenzene	1.483	1.438	3.0	92	0.00	5.05
20 t	2,2'-oxybis(1-Chloropropylamin	2.433	2.558	-5.1	103	0.00	5.13
22 t	n-Nitroso-di-n-propylamin	1.190	1.031	13.4	83	0.00	5.23
23 t	Hexachloroethane	0.549	0.531	3.3	95	0.00	5.33
24 I	Naphthalene-d8	1.000	1.000	0.0	91	0.00	6.04
26 t	Nitrobenzene	0.466	0.466	0.0	88	0.00	5.38
28 t	Isophorone	0.809	0.842	-4.1	93	0.00	5.59
32 t	bis(2-Chloroethoxy)methan	0.433	0.453	-4.6	92	0.00	5.78
36 t	1,2,4-Trichlorobenzene	0.320	0.328	-2.5	90	0.00	5.98
38 t	Naphthalene	1.137	1.182	-4.0	92	0.00	6.06
42 t	Hexachlorobutadiene	0.189	0.206	-9.0	97	0.00	6.20
47 I	Acenaphthene-d10	1.000	1.000	0.0	81	0.00	8.15
48 t	Hexachlorocyclopentadiene	0.357	0.344	3.6	72	0.00	7.01
52 t	2-Chloronaphthalene	1.132	1.249	-10.3	91	0.00	7.41
55 t	Dimethylphthalate	1.310	1.335	-1.9	82	0.00	7.80
56 t	Acenaphthylene	1.851	1.892	-2.2	82	0.00	7.96
57 t	2,6-Dinitrotoluene	0.276	0.257	6.9	72	0.00	7.86
59 t	Acenaphthene	1.107	1.198	-8.2	87	0.00	8.20
63 t	2,4-Dinitrotoluene	0.397	0.331	16.6	63	0.00	8.43
65 t	Diethylphthalate	1.445	1.364	5.6	74	0.00	8.80
66 t	Fluorene	1.346	1.385	-2.9	82	0.00	8.93
67 t	4-Chlorophenyl-phenylethe	0.626	0.626	0.0	80	0.00	8.95
69 I	Phenanthrene-d10	1.000	1.000	0.0	78	0.00	10.34
		AvgRF	CCRF	% Dev			
71 t	n-Nitrosodiphenylamine	0.540	0.515	4.6	70	0.00	9.13
72 t	1,2-Diphenylhydrazine	0.970	0.928	4.3	72	0.00	9.18
74 t	4-Bromophenyl-phenylether	0.227	0.239	-5.3	78	0.00	9.68
75 t	Hexachlorobenzene	0.286	0.280	2.1	75	0.00	9.77
77 t	Phenanthrene	1.121	1.184	-5.6	81	0.00	10.38
78 t	Anthracene	1.116	1.142	-2.3	79	0.00	10.46
80 t	Di-n-butylphthalate	1.473	1.377	6.5	69	0.00	11.35
81 t	Fluoranthene	1.213	1.203	0.8	74	0.00	12.25

# Initial Calibration Verification

Page 2 of 2

Job Number: JC4006

Sample: E2M3347-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77119.D

Project: Sunoco - Marcus Hook Facility, PA

83	I	Chrysene-d12	1.000	1.000	0.0	70	0.00	14.54
84	t	Pyrene	1.301	1.342	-3.2	70	0.00	12.60
86	t	Butylbenzylphthalate	0.671	0.656	2.2	67	0.00	13.73
88	t	Benzo[a]anthracene	1.246	1.279	-2.6	74	0.00	14.52
89	t	3,3'-Dichlorobenzidine	0.451	0.367	18.6	54	0.00	14.52
90	t	Chrysene	1.070	1.092	-2.1	74	0.00	14.58
91	t	bis(2-Ethylhexyl)phthalat	0.844	0.827	2.0	67	0.00	14.69
92	I	Perylene-d12	1.000	1.000	0.0	66	0.00	16.65
93	t	Di-n-octylphthalate	1.516	1.499	1.1	64	0.00	15.68
94	t	Benzo[b]fluoranthene	1.273	1.174	7.8	62	0.00	16.13
95	t	Benzo[k]fluoranthene	1.121	1.176	-4.9	69	0.00	16.17
96	t	Benzo[a]pyrene	1.047	1.091	-4.2	69	0.00	16.57
97	t	Indeno[1,2,3-cd]pyrene	1.107	1.207	-9.0	71	0.00	18.30
99	t	Dibenz[a,h]anthracene	1.081	1.165	-7.8	69	0.00	18.34
101	t	Benzo[g,h,i]perylene	1.070	1.200	-12.1	74	0.00	18.78

( # ) = Out of Range  
2m77111a.D M2M3346.MSPCC's out = 0 CCC's out = 0  
Mon Aug 31 09:47:22 20158.7.4  
8

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3347

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77119A.D

Project: Sunoco - Marcus Hook Facility, PA

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3347\2m77119a.D Vial: 20  
 Acq On : 29 Aug 2015 9:41 pm Operator: kristis  
 Sample : icv3347-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
104	Acenaphthene-d10a	1.000	1.000	0.0	82	0.00
105	1,2,4,5-Tetrachlorobenzen	0.512	0.589	-15.0	91	0.00
106	Chrysene-d12a	1.000	1.000	0.0	74	0.00
107	Benzidine	0.615	0.600	2.4	67	0.00

(#) = Out of Range  
 2m77111a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 09:47:23 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 2M77120.D

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3347\2m77120.D Vial: 21  
 Acq On : 29 Aug 2015 10:08 pm Operator: kristis  
 Sample : icv3346-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	102	0.00
2 t	1,4-Dioxane	0.648	0.520	19.8	84	0.02
6 t	Indene	2.989	2.768	7.4	91	0.00
7 t	Cumene	4.363	4.160	4.7	94	0.00
13 t	Decane	2.017	1.881	6.7	96	0.00
18 t	Acetophenone	2.460	2.176	11.5	88	0.00
24 I	Naphthalene-d8	1.000	1.000	0.0	115	0.00
27 t	Quinoline	0.742	0.571	23.0	88	0.00
40 t	2,3-Dichloroaniline	0.369	0.238	35.5#	73	0.00
41 t	Caprolactam	0.208	0.147	29.3	80	-0.04
45 t	1-Methylnaphthalene	0.619	0.474	23.4	87	0.00
46 t	Dimethylnaphthalene	0.667	0.509	23.7	85	0.00
47 I	Acenaphthene-d10	1.000	1.000	0.0	89	0.00
53 t	Biphenyl	1.538	1.444	6.1	84	0.00
69 I	Phenanthrene-d10	1.000	1.000	0.0	85	0.00
82 t	Octadecane	0.752	0.730	2.9	81	0.00
92 I	Perylene-d12	1.000	1.000	0.0	66	0.00
100 t	7,12-Dimethylbenz(a)anthr	0.510	0.150	70.6#	17#	-0.01

(#) = Out of Range  
 2m77111a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 09:57:43 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3347

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77120A.D

Project: Sunoco - Marcus Hook Facility, PA

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3347\2m77120a.D Vial: 21  
 Acq On : 29 Aug 2015 10:08 pm Operator: kristis  
 Sample : icv3347-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
102	1,4-Dichlorobenzene-d4a	1.000	1.000	0.0	100	0.00	4.91
103	Benzaldehyde	1.251	1.238	1.0	100	0.00	4.58
108	Phenanthrene-d10a	1.000	1.000	0.0	85	0.00	10.34
109	Atrazine	0.103	0.114	-10.7	90	0.00	9.97

(#) = Out of Range  
 2m77111a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 09:57:44 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77121.D

Project: Sunoco - Marcus Hook Facility, PA

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3347\2m77121.D Vial: 22  
 Acq On : 29 Aug 2015 10:34 pm Operator: kristis  
 Sample : icv3346-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	105	0.00
5 S	2-Fluorophenol	1.405	1.345	4.3	97	0.00
8 S	Phenol-d5	1.855	1.681	9.4	92	0.00
24 I	Naphthalene-d8	1.000	1.000	0.0	103	0.00
25 S	Nitrobenzene-d5	0.451	0.479	-6.2	108	0.00
47 I	Acenaphthene-d10	1.000	1.000	0.0	87	0.00
51 S	2-Fluorobiphenyl	1.252	1.380	-10.2	96	0.00
69 I	Phenanthrene-d10	1.000	1.000	0.0	81	0.00
73 S	2,4,6-Tribromophenol	0.145	0.133	8.3	69	0.00
83 I	Chrysene-d12	1.000	1.000	0.0	65	0.00
85 S	Terphenyl-d14	0.871	1.013	-16.3	73	0.00

(#) = Out of Range  
 2m77111a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 10:04:56 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3347-ICV3347

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77123.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\e2m3347\2m77123.D Vial: 24  
 Acq On : 29 Aug 2015 11:28 pm Operator: kristis  
 Sample : icv3347-50 Inst : MS  
 Misc : op86605,e2m3347,1000,,,1,1 Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
110 Naphthalene-d8a	1.000	1.000	0.0	69	0.00	6.04
111 Hydroquinone	0.331	0.408	-23.3	79	0.00	6.45

(#) = Out of Range SPCC's out = 0 CCC's out = 0  
 2m77111a.D M2M3346.M Mon Aug 31 10:07:56 2015

**Initial Calibration Verification**

Job Number: JC4006

Sample: E2M3348-ICV3346

Account: SECORPAE Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

Lab FileID: 2M77126.D

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3348\2m77126.D Vial: 2  
 Acq On : 31 Aug 2015 9:42 am Operator: ashley  
 Sample : icv3346-50 Inst : MS  
 Misc : op86605,e2m3348, Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Mon Aug 31 09:32:21 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	96	0.00
9 t	Phenol	2.150	1.769	17.7	74	0.00
12 t	2-Chlorophenol	1.531	1.355	11.5	85	-0.01
19 t	2-Methylphenol	1.387	1.347	2.9	93	-0.01
21 t	3&4-Methylphenol	1.551	1.389	10.4	83	-0.01
24 I	Naphthalene-d8	1.000	1.000	0.0	94	-0.01
29 t	2-Nitrophenol	0.193	0.178	7.8	81	-0.01
30 t	2,4-Dimethylphenol	0.420	0.414	1.4	87	-0.01
31 t	Benzoic acid	0.265	0.251	5.3	82	-0.01
33 t	2,4-Dichlorophenol	0.286	0.259	9.4	82	-0.01
34 t	2,6-Dichlorophenol	0.289	0.262	9.3	84	-0.01
43 t	4-Chloro-3-methylphenol	0.380	0.351	7.6	81	-0.02
47 I	Acenaphthene-d10	1.000	1.000	0.0	92	-0.01
49 t	2,4,6-Trichlorophenol	0.357	0.322	9.8	80	-0.01
50 t	2,4,5-Trichlorophenol	0.348	0.334	4.0	87	-0.02
60 t	2,4-Dinitrophenol	100.000	70.166	True Calc.	% Drift	-----
61 t	4-Nitrophenol	0.292	0.293	-0.3	84	-0.01
64	2,3,4,6-Tetrachlorophenol	0.301	0.254	15.6	73	-0.01
69 I	Phenanthrene-d10	1.000	1.000	0.0	94	-0.02
70 t	4,6-Dinitro-2-methylpheno	50.000	35.163	True Calc.	% Drift	-----
76 t	Pentachlorophenol	0.172	0.150	12.8	72	-0.02

(#) = Out of Range  
 2m7711a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Mon Aug 31 10:11:29 2015

**Continuing Calibration Summary**

Job Number: JC4006

Sample: E2M3372-CC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77573.D

Project: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\e2m3372\2m77573.D Vial: 2  
 Acq On : 18 Sep 2015 10:40 am Operator: ashley  
 Sample : cc3346-25 Inst : MS  
 Misc : op87280,e2m3372, Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Fri Sep 11 15:35:15 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)R.T.	
1 I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	93	0.00	4.78
2 t	1,4-Dioxane	0.648	0.621	4.2	86	0.00	2.37
3 t	Pyridine	1.532	1.511	1.4	86	-0.02	2.69
4 t	N-Nitrosodimethylamine	0.918	0.827	9.9	79	0.00	2.66
5 S	2-Fluorophenol	1.405	1.446	-2.9	89	0.00	3.84
6 t	Indene	2.989	2.940	1.6	88	0.00	4.99
7 t	Cumene	4.363	3.932	9.9	80	0.00	4.18
8 S	Phenol-d5	1.855	1.859	-0.2	86	0.00	4.55
9 t	Phenol	2.150	2.144	0.3	85	0.00	4.55
10	Aniline	2.278	2.218	2.6	86	0.00	4.54
11 t	bis(2-Chloroethyl)ether	1.434	1.370	4.5	85	0.00	4.58
12 t	2-Chlorophenol	1.531	1.541	-0.7	91	0.00	4.64
13 t	Decane	2.017	1.297	35.7#	55	0.00	4.64
14 t	1,3-Dichlorobenzene	1.572	1.660	-5.6	95	0.00	4.74
15 t	1,4-Dichlorobenzene	1.619	1.729	-6.8	92	0.00	4.79
16 t	Benzyl alcohol	1.002	0.947	5.5	82	0.00	4.90
17 t	1,2-Dichlorobenzene	1.483	1.605	-8.2	96	0.00	4.92
18 t	Acetophenone	2.460	2.292	6.8	83	0.00	5.10
19 t	2-Methylphenol	1.387	1.366	1.5	87	0.00	5.01
20 t	2,2'-oxybis(1-Chloropropane)	2.433	1.482	39.1#	53	0.00	4.99
21 t	3&4-Methylphenol	1.551	1.450	6.5	84	0.00	5.13
22 t	n-Nitroso-di-n-propylamin	1.190	1.118	6.1	83	0.00	5.10
23 t	Hexachloroethane	0.549	0.569	-3.6	91	0.00	5.19
24 I	Naphthalene-d8	1.000	1.000	0.0	101	0.00	5.89
25 S	Nitrobenzene-d5	0.451	0.388	14.0	80	0.00	5.23
26 t	Nitrobenzene	0.466	0.400	14.2	81	0.00	5.25
27 t	Quinoline	0.742	0.765	-3.1	98	0.00	6.25
28 t	Isophorone	0.809	0.690	14.7	80	0.00	5.45
29 t	2-Nitrophenol	0.193	0.219	-13.5	105	0.00	5.53
30 t	2,4-Dimethylphenol	0.420	0.393	6.4	89	0.00	5.58
31 t	Benzoic acid	0.265	0.242	8.7	88	-0.02	5.68
32 t	bis(2-Chloroethoxy)methane	0.433	0.383	11.5	85	0.00	5.64
33 t	2,4-Dichlorophenol	0.286	0.309	-8.0	101	0.00	5.77
34 t	2,6-Dichlorophenol	0.289	0.305	-5.5	102	0.00	5.98
35 t	1,3,5-Trichlorobenzene	0.345	0.349	-1.2	96	0.00	5.53
36 t	1,2,4-Trichlorobenzene	0.320	0.329	-2.8	99	0.00	5.83
37 t	1,2,3-Trichlorobenzene	0.313	0.317	-1.3	93	0.00	6.05
38 t	Naphthalene	1.137	1.112	2.2	95	0.00	5.91
39 t	4-Chloroaniline	0.450	0.417	7.3	86	0.00	5.97
40 t	2,3-Dichloroaniline	0.369	0.389	-5.4	103	0.00	6.99
41 t	Caprolactam	0.208	0.139	33.2#	61	-0.03	6.33

# Continuing Calibration Summary

Page 2 of 3

Job Number: JC4006

Sample: E2M3372-CC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77573.D

Project: Sunoco - Marcus Hook Facility, PA

42 t	Hexachlorobutadiene	0.189	0.184	2.6	89	0.00	6.03
43 t	4-Chloro-3-methylphenol	0.380	0.356	6.3	88	0.00	6.52
44 t	2-Methylnaphthalene	0.582	0.622	-6.9	103	0.00	6.65
45 t	1-Methylnaphthalene	0.619	0.677	-9.4	105	0.00	6.76
46 t	Dimethylnaphthalene	0.667	0.722	-8.2	103	0.00	7.41
47 I	Acenaphthene-d10	1.000	1.000	0.0	105	0.00	7.96
48 t	Hexachlorocyclopentadiene	0.357	0.293	17.9	78	0.00	6.83
49 t	2,4,6-Trichlorophenol	0.357	0.367	-2.8	99	0.00	7.00
50 t	2,4,5-Trichlorophenol	0.348	0.365	-4.9	102	0.00	7.06
51 S	2-Fluorobiphenyl	1.252	1.219	2.6	99	0.00	7.08
52 t	2-Chloronaphthalene	1.132	1.143	-1.0	99	0.00	7.23
53 t	Biphenyl	1.538	1.553	-1.0	102	0.00	7.21
54 t	2-Nitroaniline	0.454	0.386	15.0	80	0.00	7.38
55 t	Dimethylphthalate	1.310	1.257	4.0	94	0.00	7.62
56 t	Acenaphthylene	1.851	1.843	0.4	101	0.00	7.77
57 t	2,6-Dinitrotoluene	0.276	0.307	-11.2	105	0.00	7.69
58 t	3-Nitroaniline	0.318	0.339	-6.6	106	0.00	7.93
59 t	Acenaphthene	1.107	1.171	-5.8	104	0.00	8.00
-----		True	Calc.	% Drift	-----		
60 t	2,4-Dinitrophenol	50.000	39.173	21.7#	75	0.00	8.08
-----		AvgRF	CCRF	% Dev	-----		
61 t	4-Nitrophenol	0.292	0.200	31.5#	62	0.00	8.27
62 t	Dibenzofuran	1.652	1.565	5.3	95	0.00	8.25
63 t	2,4-Dinitrotoluene	0.397	0.436	-9.8	106	0.00	8.26
64 t	2,3,4,6-Tetrachlorophenol	0.301	0.299	0.7	96	0.00	8.45
65 t	Diethylphthalate	1.445	1.275	11.8	88	-0.01	8.61
66 t	Fluorene	1.346	1.311	2.6	97	0.00	8.74
67 t	4-Chlorophenyl-phenylethane	0.626	0.604	3.5	96	0.00	8.75
68 t	4-Nitroaniline	0.335	0.328	2.1	88	-0.01	8.81
69 I	Phenanthrene-d10	1.000	1.000	0.0	103	0.00	10.14
-----		True	Calc.	% Drift	-----		
70 t	4,6-Dinitro-2-methylpheno	25.000	24.358	2.6	96	0.00	8.85
-----		AvgRF	CCRF	% Dev	-----		
71 t	n-Nitrosodiphenylamine	0.540	0.595	-10.2	105	0.00	8.93
72 t	1,2-Diphenylhydrazine	0.970	0.866	10.7	87	0.00	8.98
73 S	2,4,6-Tribromophenol	0.145	0.144	0.7	96	0.00	9.10
74 t	4-Bromophenyl-phenylether	0.227	0.231	-1.8	98	0.00	9.47
75 t	Hexachlorobenzene	0.286	0.259	9.4	89	0.00	9.56
76 t	Pentachlorophenol	0.172	0.132	23.3#	73	0.00	9.89
77 t	Phenanthrene	1.121	1.160	-3.5	103	0.00	10.18
78 t	Anthracene	1.116	1.192	-6.8	105	0.00	10.25
79 t	Carbazole	1.054	1.125	-6.7	105	0.00	10.53
80 t	Di-n-butylphthalate	1.473	1.341	9.0	89	-0.01	11.13
81 t	Fluoranthene	1.213	1.266	-4.4	103	0.00	12.03
82 t	Octadecane	0.752	0.467	37.9#	59	-0.01	10.05
83 I	Chrysene-d12	1.000	1.000	0.0	117	0.00	14.31
84 t	Pyrene	1.301	1.238	4.8	104	0.00	12.38
85 S	Terphenyl-d14	0.871	0.824	5.4	104	0.00	12.68
86 t	Butylbenzylphthalate	0.671	0.579	13.7	94	-0.01	13.50
87	Butyl stearate	0.466	0.290	37.8#	67	-0.02	13.64
88 t	Benzo[a]anthracene	1.246	1.193	4.3	114	0.00	14.29
89 t	3,3'-Dichlorobenzidine	0.451	0.428	5.1	102	0.00	14.30
90 t	Chrysene	1.070	1.127	-5.3	121	0.00	14.35

# Continuing Calibration Summary

Page 3 of 3

Job Number: JC4006

Sample: E2M3372-CC3346

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77573.D

Project: Sunoco - Marcus Hook Facility, PA

91 t	bis(2-Ethylhexyl)phthalat	0.844	0.744	11.8	97	-0.02	14.44
92 I	Perylene-d12	1.000	1.000	0.0	102	0.00	16.42
93 t	Di-n-octylphthalate	1.516	1.434	5.4	95	-0.02	15.42
94 t	Benzo[b]fluoranthene	1.273	1.292	-1.5	107	0.00	15.90
95 t	Benzo[k]fluoranthene	1.121	1.159	-3.4	106	-0.01	15.93
96 t	Benzo[a]pyrene	1.047	1.137	-8.6	112	0.00	16.34
97 t	Indeno[1,2,3-cd]pyrene	1.107	1.105	0.2	96	0.00	17.97
98 t	Dibenz(a,h)acridine	0.982	1.075	-9.5	110	0.00	17.61
99 t	Dibenz[a,h]anthracene	1.081	1.170	-8.2	110	0.00	18.01
100 t	7,12-Dimethylbenz(a)anthr	0.510	0.620	-21.6#	118	-0.01	15.89
101 t	Benzo[g,h,i]perylene	1.070	1.118	-4.5	107	0.00	18.42

(#) = Out of Range  
2m77112a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
Fri Sep 18 15:57:08 2015

8.7.11

8

**Continuing Calibration Summary**

Job Number: JC4006

Sample: E2M3372-CC3347

Account: SECORPAE Stantec Consulting Services Inc.

Lab FileID: 2M77574.D

Project: Sunoco - Marcus Hook Facility, PA

**Evaluate Continuing Calibration Report**

Data File : C:\msdchem\1\DATA\e2m3372\2m77574.D Vial: 3  
 Acq On : 18 Sep 2015 11:10 am Operator: ashley  
 Sample : cc3347-25 Inst : MS  
 Misc : op87280,e2m3372, Multiplr: 1.00  
 MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M2M3346.M (RTE Integrator)  
 Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 Last Update : Fri Sep 11 15:35:15 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
102	1,4-Dichlorobenzene-d4a	1.000	1.000	0.0	94	0.00	4.78
103	Benzaldehyde	1.251	1.230	1.7	94	0.00	4.45
104	Acenaphthene-d10a	1.000	1.000	0.0	99	0.00	7.96
105	1,2,4,5-Tetrachlorobenzene	0.512	0.492	3.9	95	-0.18	6.84
106	Chrysene-d12a	1.000	1.000	0.0	107	0.00	14.30
107	Benzidine	0.615	0.399	35.1#	60	0.00	12.29
108	Phenanthrene-d10a	1.000	1.000	0.0	100	0.00	10.14
109	Atrazine	0.103	0.116	-12.6	111	-0.04	9.77
110	Naphthalene-d8a	1.000	1.000	0.0	99	0.00	5.89
111	Hydroquinone	0.331	0.293	11.5	88	-0.01	6.36

(#) = Out of Range  
 2m77112a.D M2M3346.M

SPCC's out = 0 CCC's out = 0  
 Fri Sep 18 15:58:18 2015



## GC/MS Semi-volatiles

---

### Raw Data

---

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77586.D  
 Acq On : 18 Sep 2015 4:30 pm  
 Operator : ashleyn  
 Sample : jc4006-1  
 Misc : op87306,e2m3372,31.7  
 ALS Vial : 15 Sample Multiplier: 1

Quant Time: Sep 18 20:07:04 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

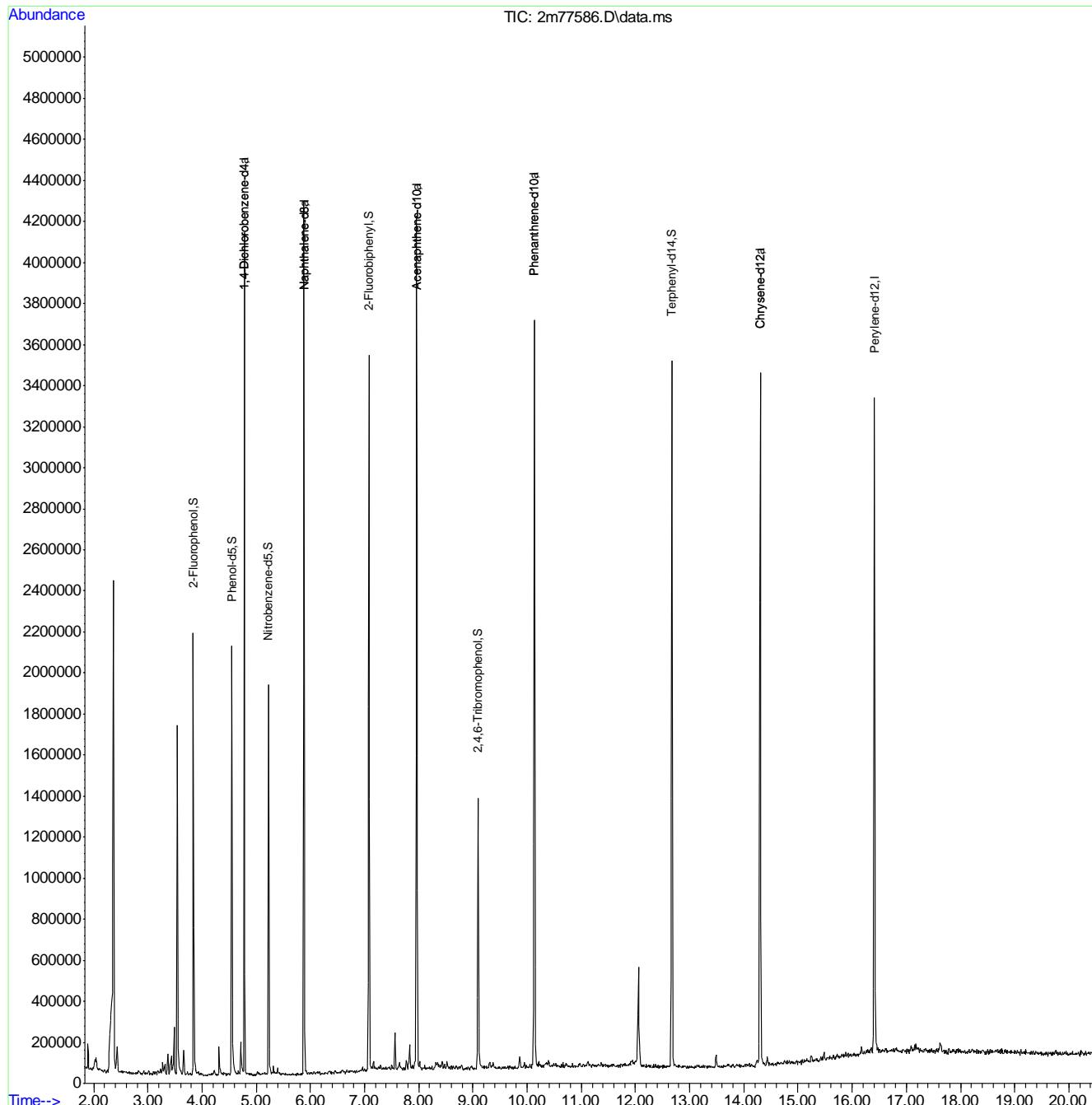
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	4.779	152	456427	40.00	ppm	0.00
24) Naphthalene-d8	5.880	136	1834287	40.00	ppm	0.00
47) Acenaphthene-d10	7.961	164	1008742	40.00	ppm	0.00
69) Phenanthrene-d10	10.133	188	1552529	40.00	ppm	0.00
83) Chrysene-d12	14.304	240	1541333	40.00	ppm	0.00
92) Perylene-d12	16.412	264	1388115	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.779	152	456427	40.00	ppm	0.00
104) Acenaphthene-d10a	7.961	164	1008742	40.00	ppm	0.00
106) Chrysene-d12a	14.304	240	1541333	40.00	ppm	0.00
108) Phenanthrene-d10a	10.133	188	1552529	40.00	ppm	0.00
110) Naphthalene-d8a	5.880	136	1834287	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.837	112	548593	34.23	ppm	0.00
Spiked Amount 50.000			Recovery =	68.46%		
8) Phenol-d5	4.549	99	670439	31.67	ppm	0.00
Spiked Amount 50.000			Recovery =	63.34%		
25) Nitrobenzene-d5	5.228	82	595644	28.83	ppm	0.00
Spiked Amount 50.000			Recovery =	57.66%		
51) 2-Fluorobiphenyl	7.084	172	1156920	36.65	ppm	0.00
Spiked Amount 50.000			Recovery =	73.30%		
73) 2,4,6-Tribromophenol	9.100	330	177384	31.61	ppm	0.00
Spiked Amount 50.000			Recovery =	63.22%		
85) Terphenyl-d14	12.673	244	1255457	37.41	ppm	-0.01
Spiked Amount 50.000			Recovery =	74.82%		
Target Compounds				Qvalue		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77586.D  
 Acq On : 18 Sep 2015 4:30 pm  
 Operator : ashley  
 Sample : jc4006-1  
 Misc : op87306,e2m3372,31.7  
 ALS Vial : 15 Sample Multiplier: 1

Quant Time: Sep 18 20:07:04 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77587.D  
 Acq On : 18 Sep 2015 4:57 pm  
 Operator : ashleyn  
 Sample : jc4006-2  
 Misc : op87306,e2m3372,31.4  
 ALS Vial : 16 Sample Multiplier: 1

Quant Time: Sep 18 20:08:45 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

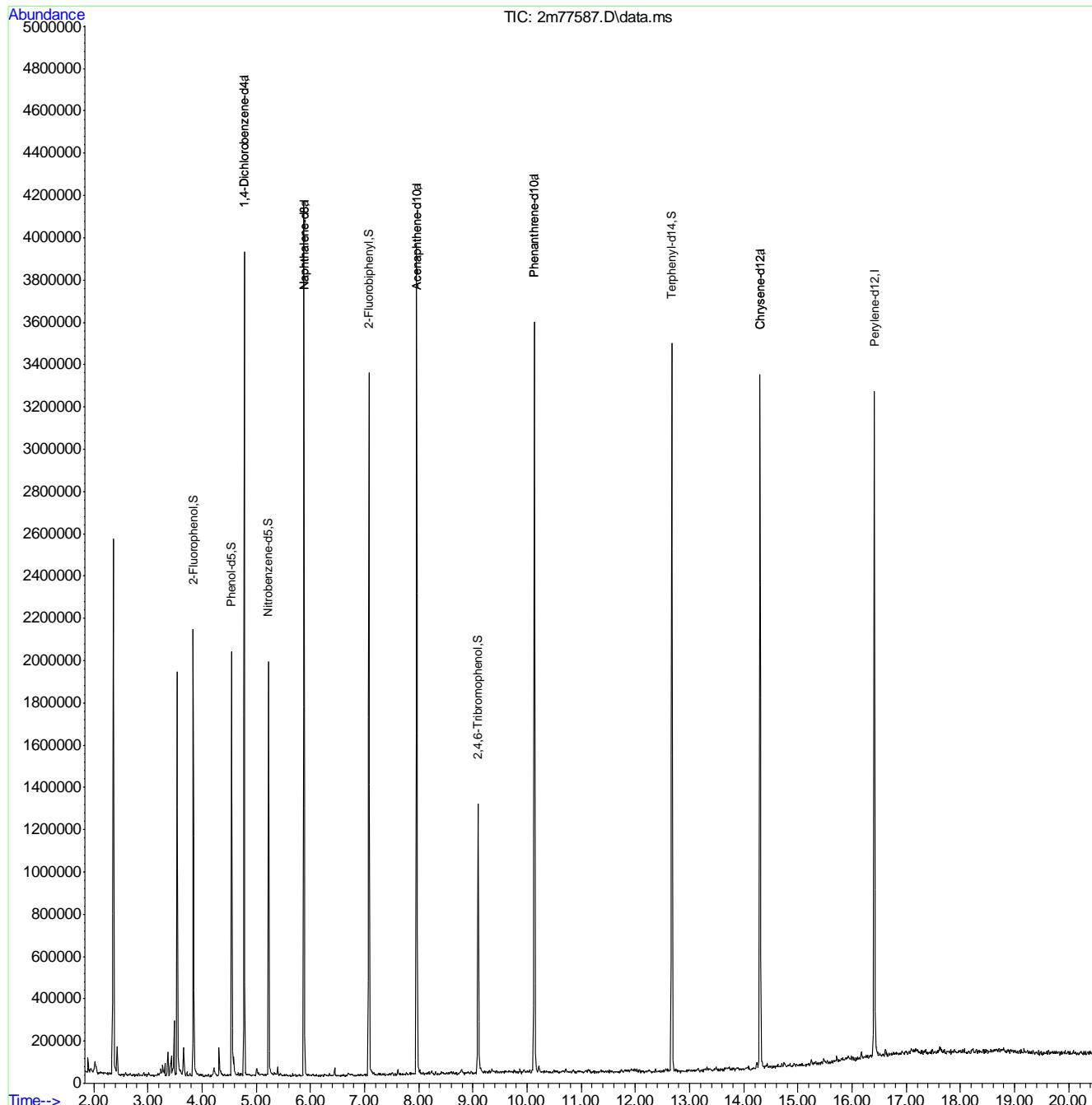
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	4.779	152	434534	40.00	ppm	0.00
24) Naphthalene-d8	5.880	136	1740046	40.00	ppm	0.00
47) Acenaphthene-d10	7.961	164	967338	40.00	ppm	0.00
69) Phenanthrene-d10	10.133	188	1481545	40.00	ppm	0.00
83) Chrysene-d12	14.299	240	1459744	40.00	ppm	-0.01
92) Perylene-d12	16.412	264	1404855	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.779	152	434534	40.00	ppm	0.00
104) Acenaphthene-d10a	7.961	164	967338	40.00	ppm	0.00
106) Chrysene-d12a	14.299	240	1459744	40.00	ppm	-0.01
108) Phenanthrene-d10a	10.133	188	1481545	40.00	ppm	0.00
110) Naphthalene-d8a	5.880	136	1740046	40.00	ppm	0.00
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.837	112	505540	33.13	ppm	0.00
Spiked Amount 50.000			Recovery	=	66.26%	
8) Phenol-d5	4.543	99	619599	30.75	ppm	0.00
Spiked Amount 50.000			Recovery	=	61.50%	
25) Nitrobenzene-d5	5.228	82	587626	29.98	ppm	0.00
Spiked Amount 50.000			Recovery	=	59.96%	
51) 2-Fluorobiphenyl	7.078	172	1122513	37.08	ppm	-0.01
Spiked Amount 50.000			Recovery	=	74.16%	
73) 2,4,6-Tribromophenol	9.100	330	180864	33.78	ppm	0.00
Spiked Amount 50.000			Recovery	=	67.56%	
85) Terphenyl-d14	12.673	244	1267650	39.88	ppm	-0.01
Spiked Amount 50.000			Recovery	=	79.76%	
<hr/>						
Target Compounds						
<hr/>						
( # ) = qualifier out of range ( m ) = manual integration ( + ) = signals summed						

9.1.2  
9

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77587.D  
 Acq On : 18 Sep 2015 4:57 pm  
 Operator : ashley  
 Sample : jc4006-2  
 Misc : op87306,e2m3372,31.4  
 ALS Vial : 16 Sample Multiplier: 1

Quant Time: Sep 18 20:08:45 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77592.D  
 Acq On : 18 Sep 2015 7:10 pm  
 Operator : ashley  
 Sample : jc4006-3  
 Misc : op87306,e2m3372,32.3  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Sep 21 10:40:12 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

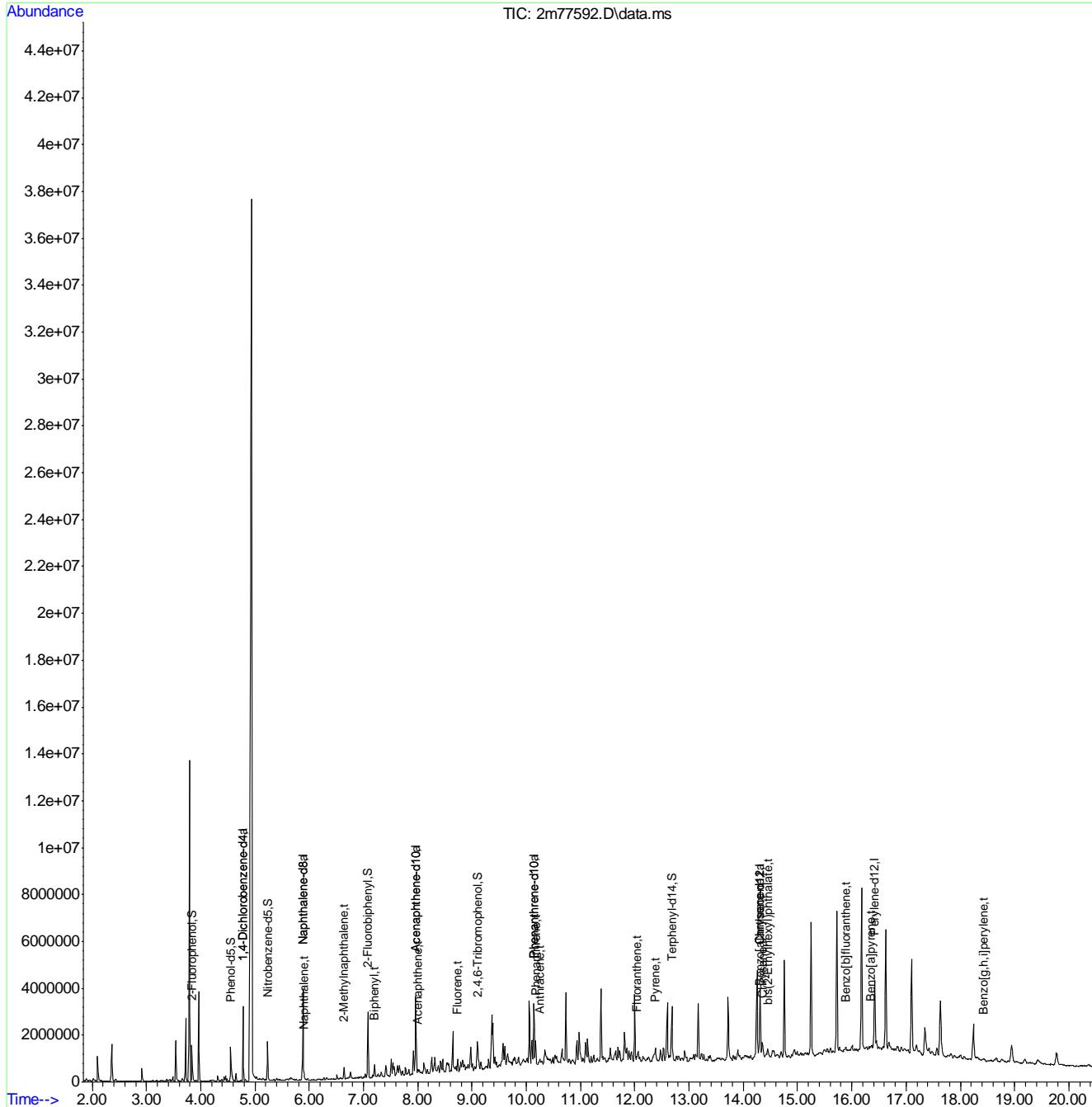
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	4.778	152	382923	40.00	ppm	0.00
24) Naphthalene-d8	5.886	136	1521979	40.00	ppm	0.00
47) Acenaphthene-d10	7.966	164	825492	40.00	ppm	0.00
69) Phenanthrene-d10	10.143	188	1164687	40.00	ppm	0.00
83) Chrysene-d12	14.310	240	1227994	40.00	ppm	0.00
92) Perylene-d12	16.422	264	1314054	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.778	152	382923	40.00	ppm	0.00
104) Acenaphthene-d10a	7.966	164	825492	40.00	ppm	0.00
106) Chrysene-d12a	14.310	240	1227994	40.00	ppm	0.00
108) Phenanthrene-d10a	10.143	188	1164687	40.00	ppm	0.00
110) Naphthalene-d8a	5.886	136	1521979	40.00	ppm	0.00
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.837	112	396671	29.50	ppm	0.00
Spiked Amount 50.000			Recovery	=	59.00%	
8) Phenol-d5	4.554	99	523905	29.50	ppm	0.01
Spiked Amount 50.000			Recovery	=	59.00%	
25) Nitrobenzene-d5	5.233	82	448064	26.13	ppm	0.00
Spiked Amount 50.000			Recovery	=	52.26%	
51) 2-Fluorobiphenyl	7.084	172	888380	34.39	ppm	0.00
Spiked Amount 50.000			Recovery	=	68.78%	
73) 2,4,6-Tribromophenol	9.105	330	128209	30.46	ppm	0.00
Spiked Amount 50.000			Recovery	=	60.92%	
85) Terphenyl-d14	12.678	244	896191	33.52	ppm	0.00
Spiked Amount 50.000			Recovery	=	67.04%	
<hr/>						
Target Compounds						
38) Naphthalene	5.907	128	102470	2.37	ppm	88
44) 2-Methylnaphthalene	6.640	141	130766	5.91	ppm	93
53) Biphenyl	7.207	154	21246	0.67	ppm	87
59) Acenaphthene	8.004	153	22627	0.99	ppm	86
66) Fluorene	8.736	166	65301	2.35	ppm	95
77) Phenanthrene	10.175	178	446634	13.69	ppm	98
78) Anthracene	10.250	178	59251	1.82	ppm	79
81) Fluoranthene	12.031	202	54502	1.54	ppm	99
84) Pyrene	12.384	202	183849	4.60	ppm	89
88) Benzo[a]anthracene	14.294	228	72470	1.89	ppm	81
90) Chrysene	14.347	228	119528	3.64	ppm	93
91) bis(2-Ethylhexyl)phtha...	14.443	149	33217	1.28	ppm	89
94) Benzo[b]fluoranthene	15.898	252	35474	0.85	ppm	92
96) Benzo[a]pyrene	16.342	252	40869	1.19	ppm	84
101) Benzo[g,h,i]perylene	18.433	276	20084	0.57	ppm	64
<hr/>						

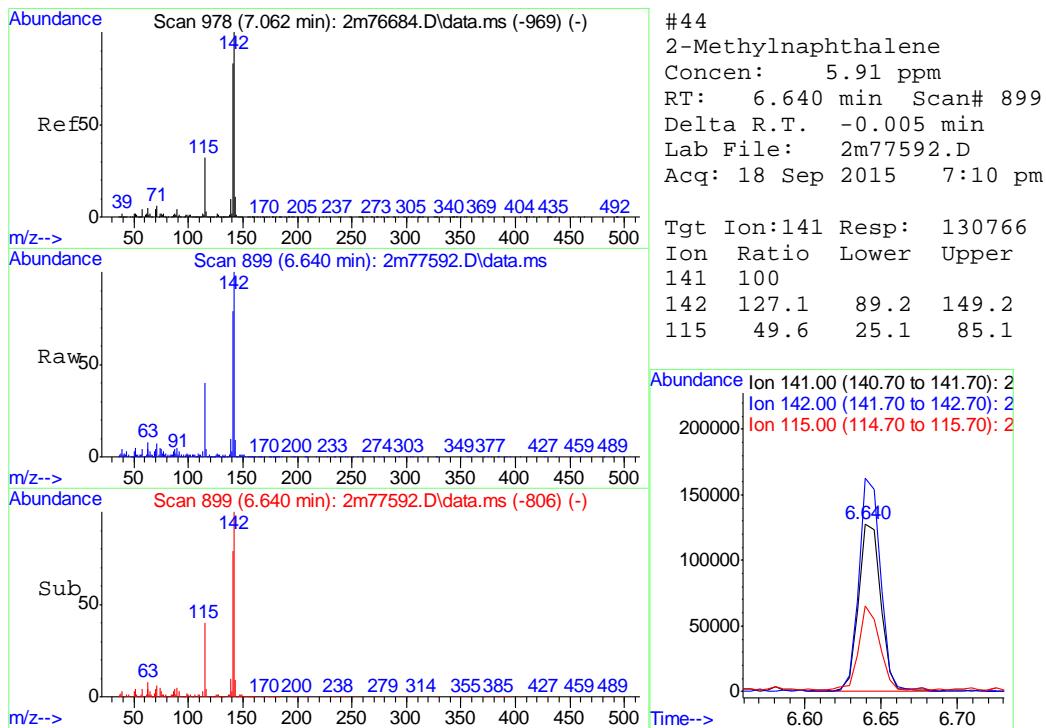
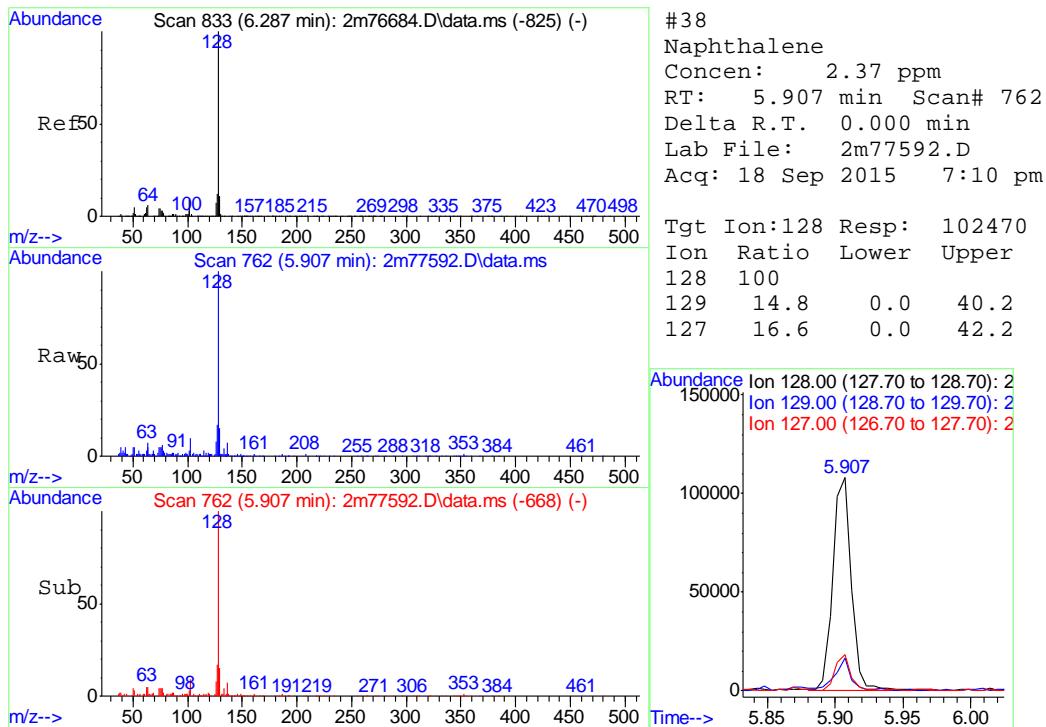
(#) = qualifier out of range (m) = manual integration (+) = signals summed

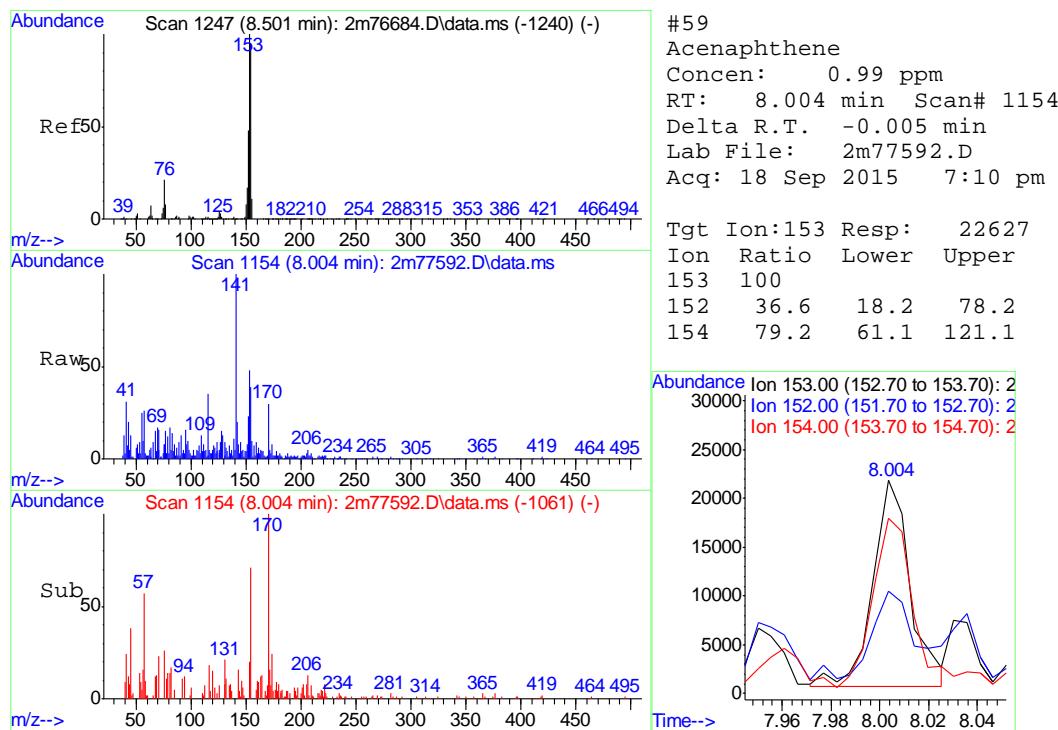
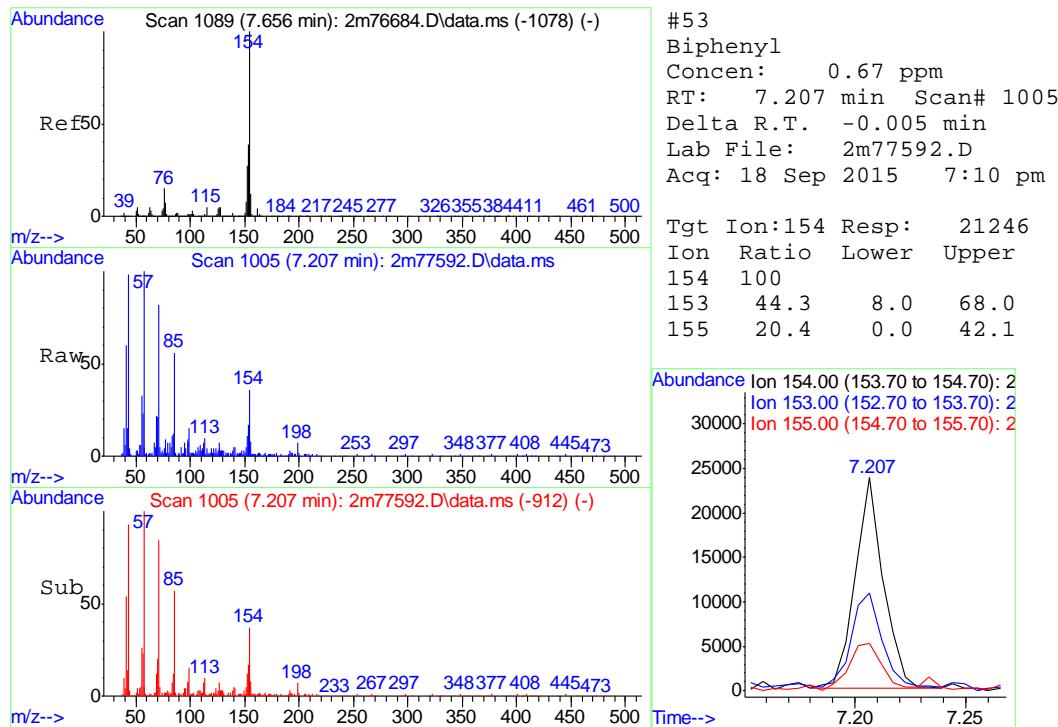
## Quantitation Report (QT Reviewed)

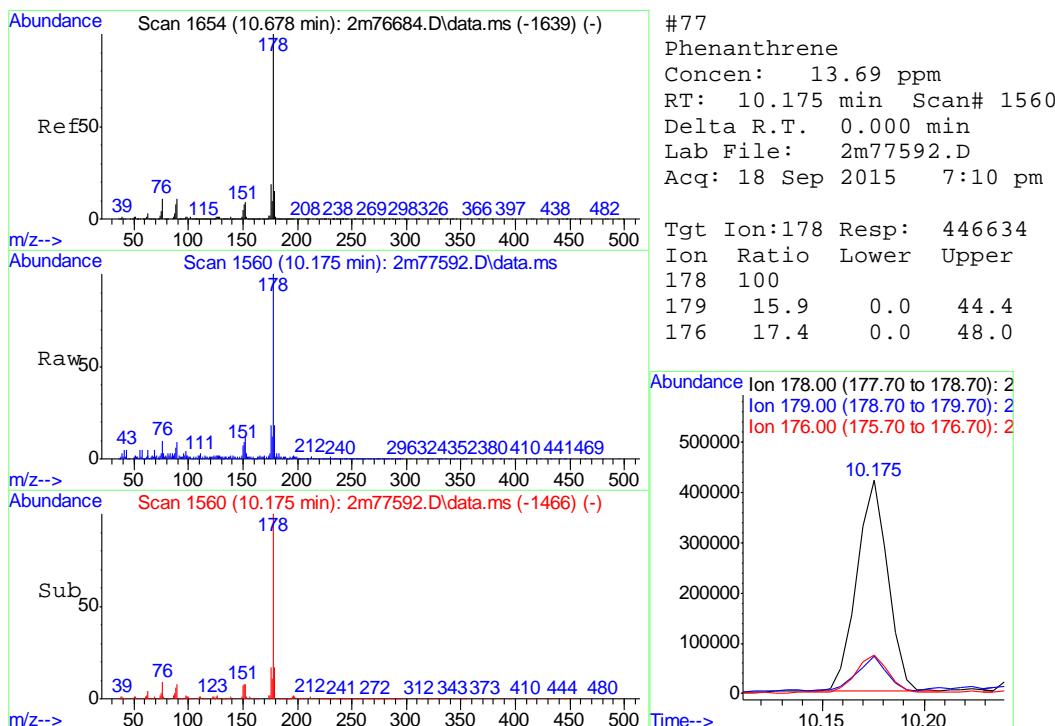
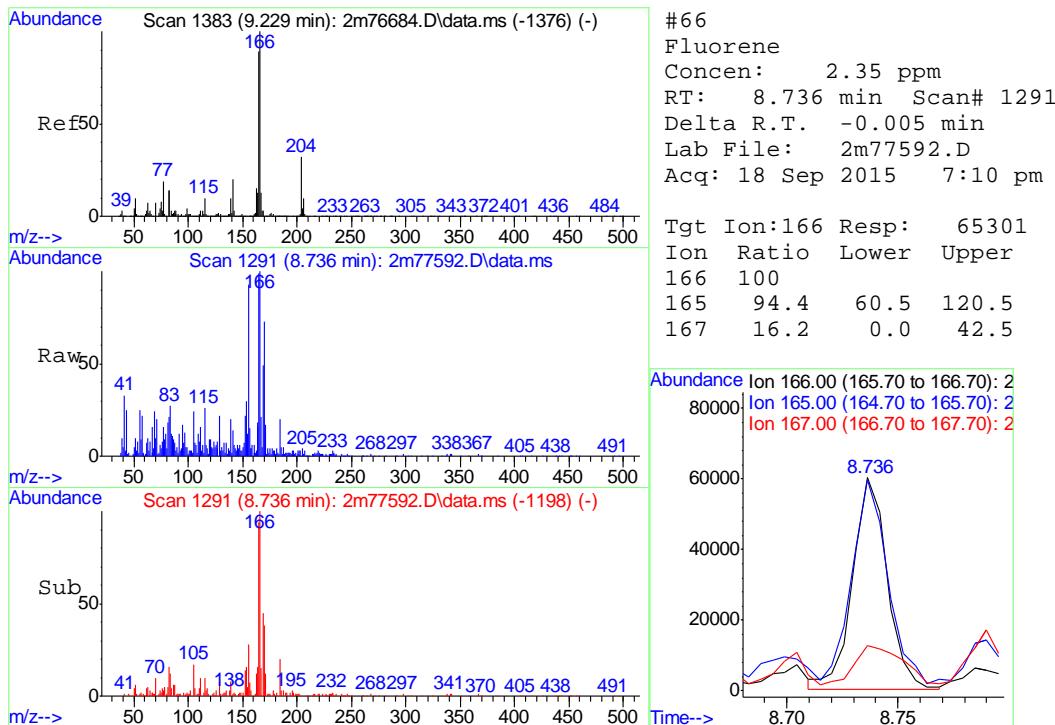
Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77592.D  
 Acq On : 18 Sep 2015 7:10 pm  
 Operator : ashley  
 Sample : jc4006-3  
 Misc : op87306,e2m3372,32.3  
 ALS Vial : 21 Sample Multiplier: 1

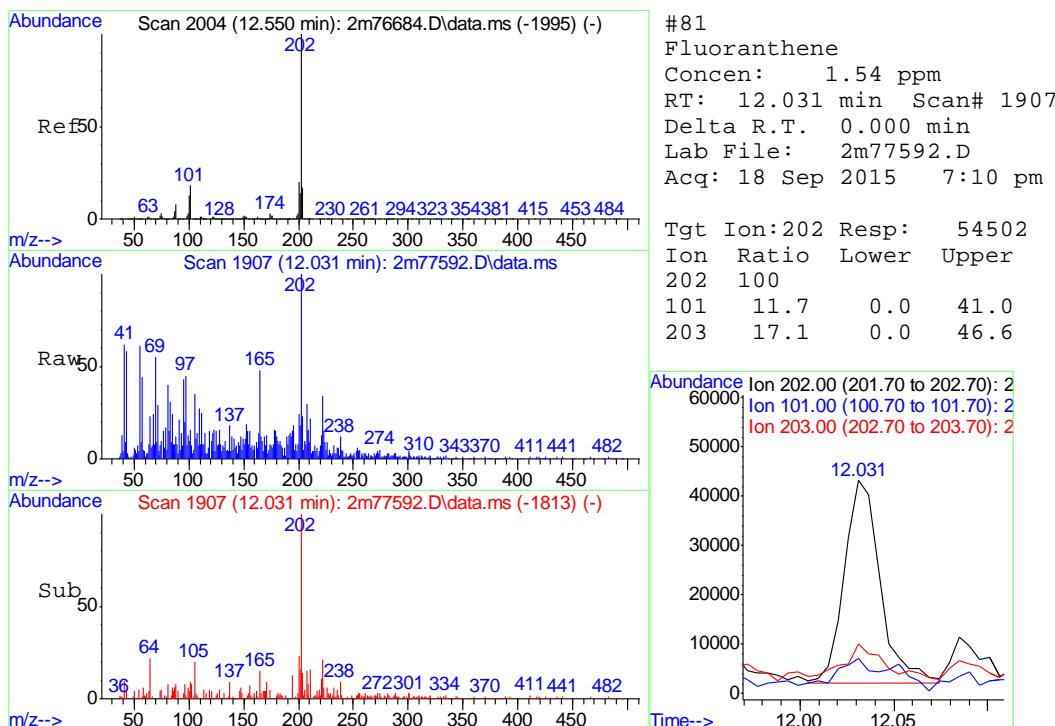
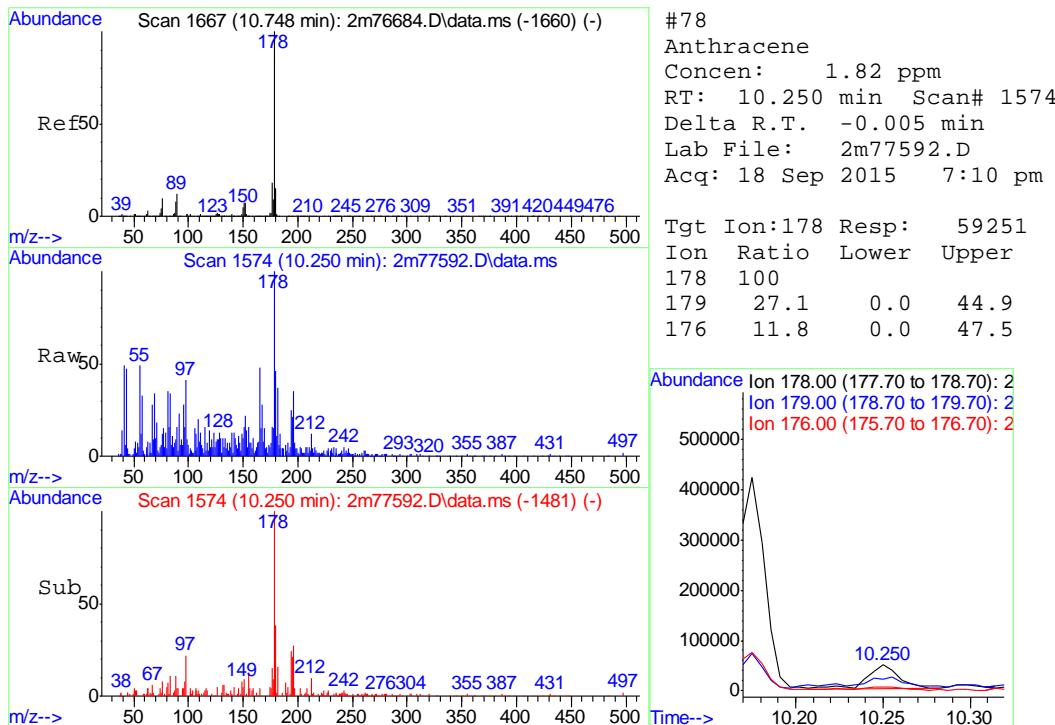
Quant Time: Sep 21 10:40:12 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

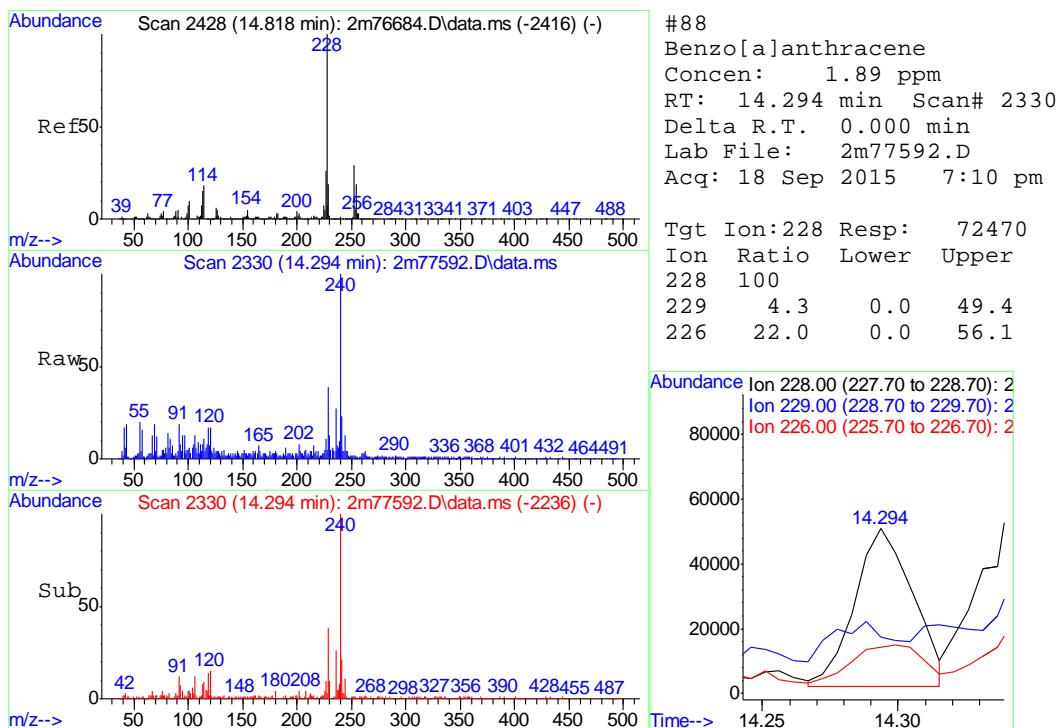
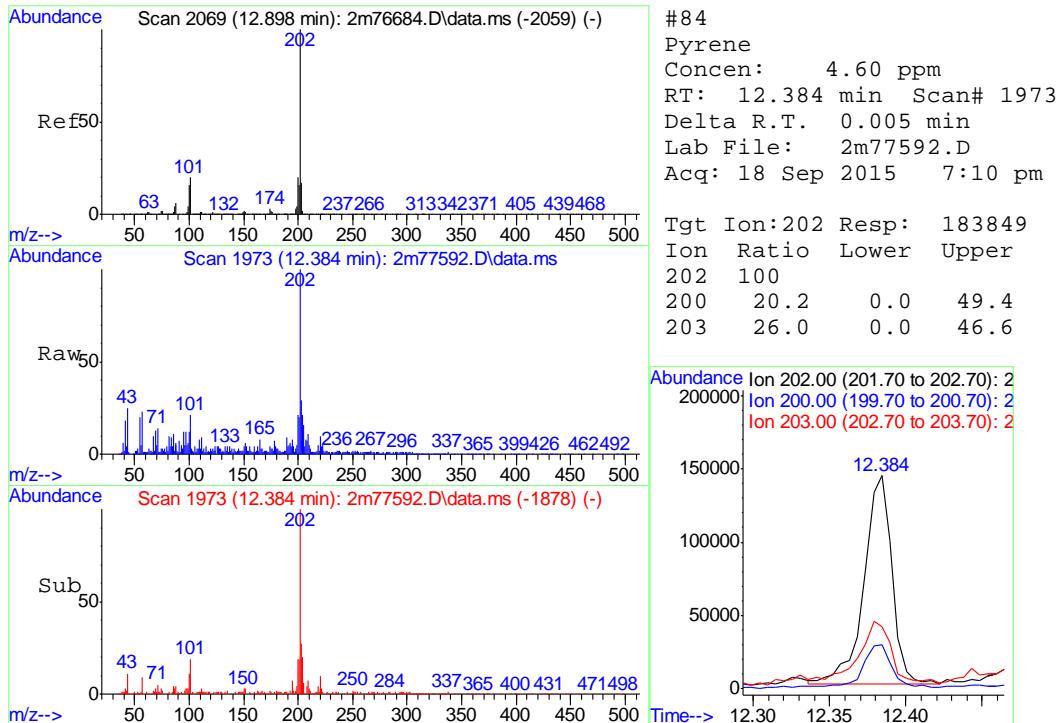


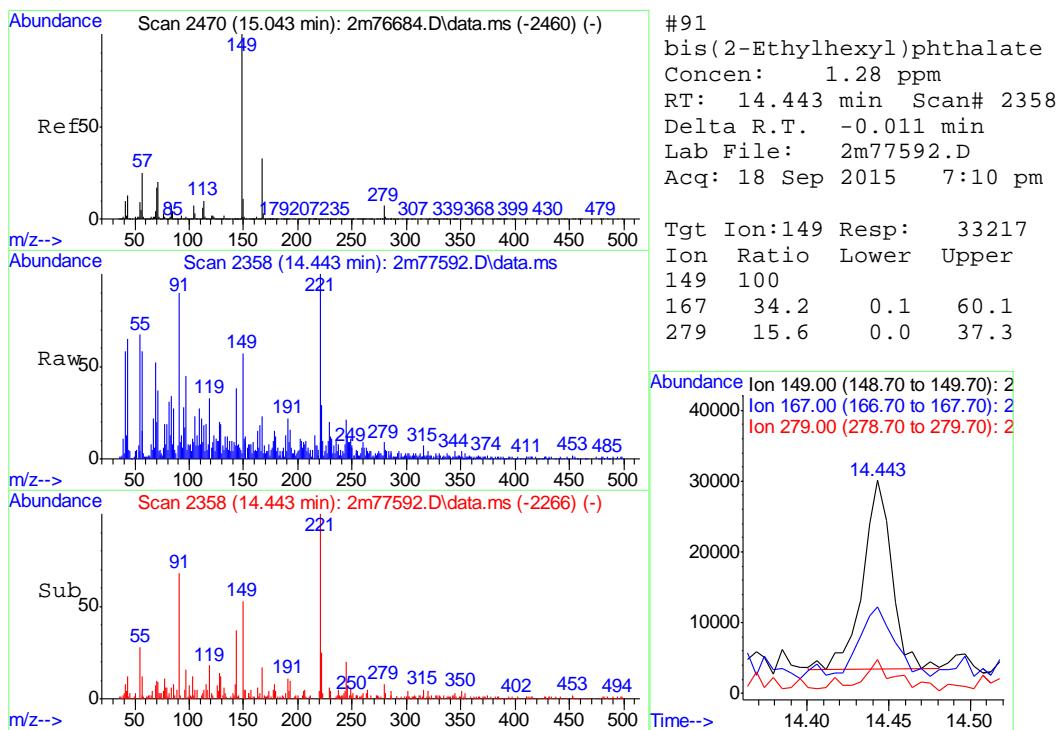
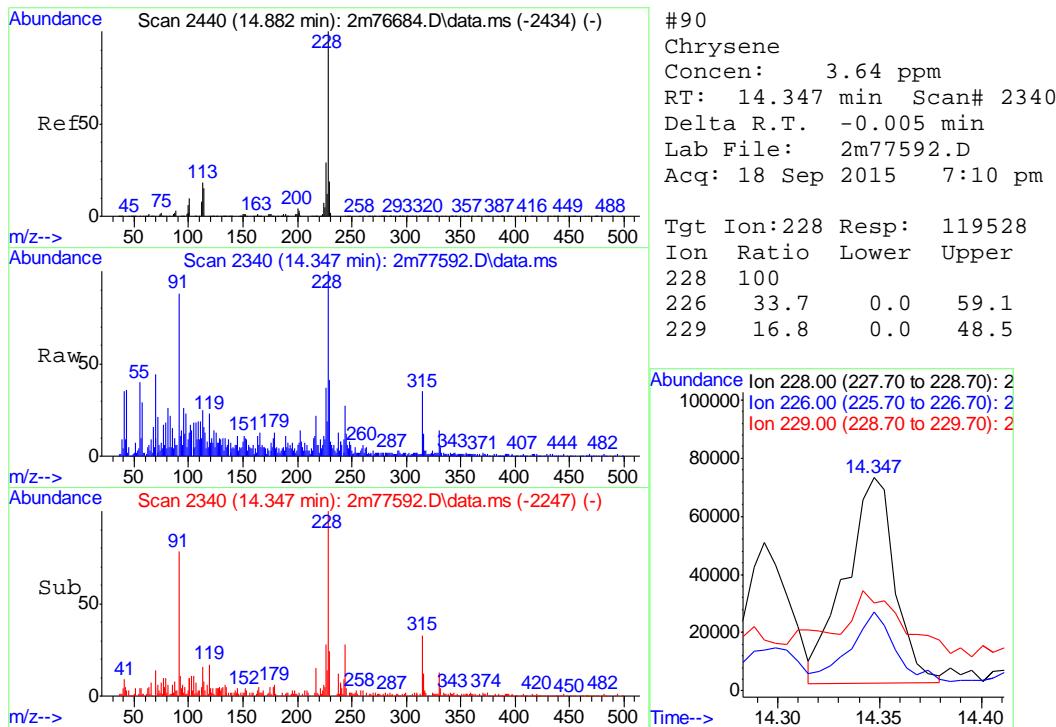


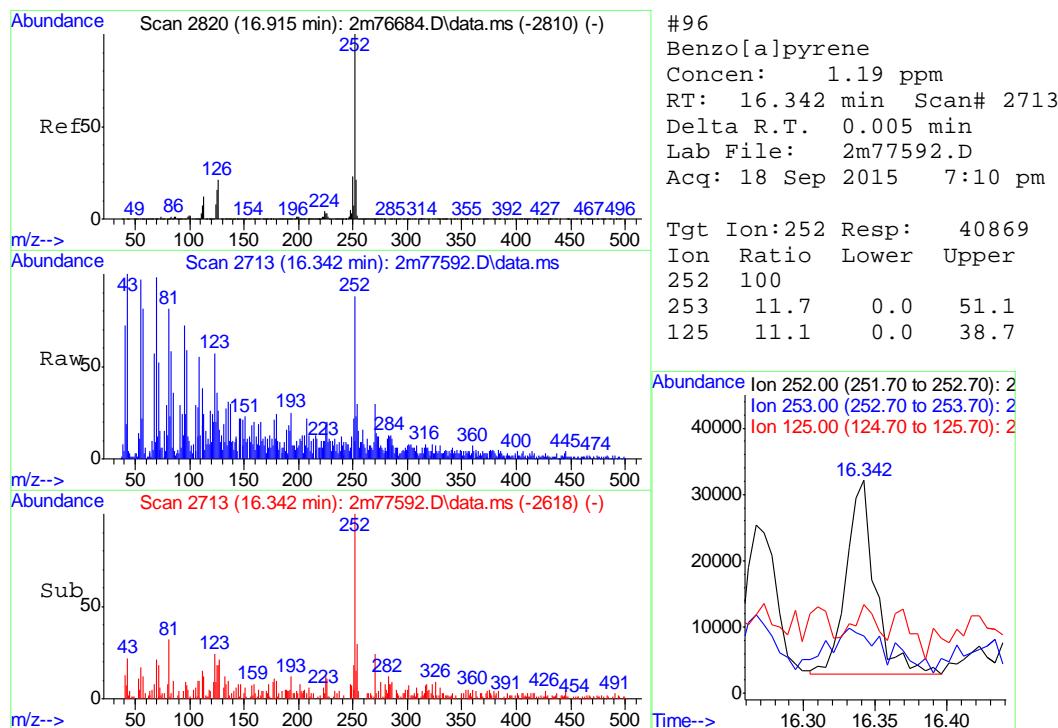
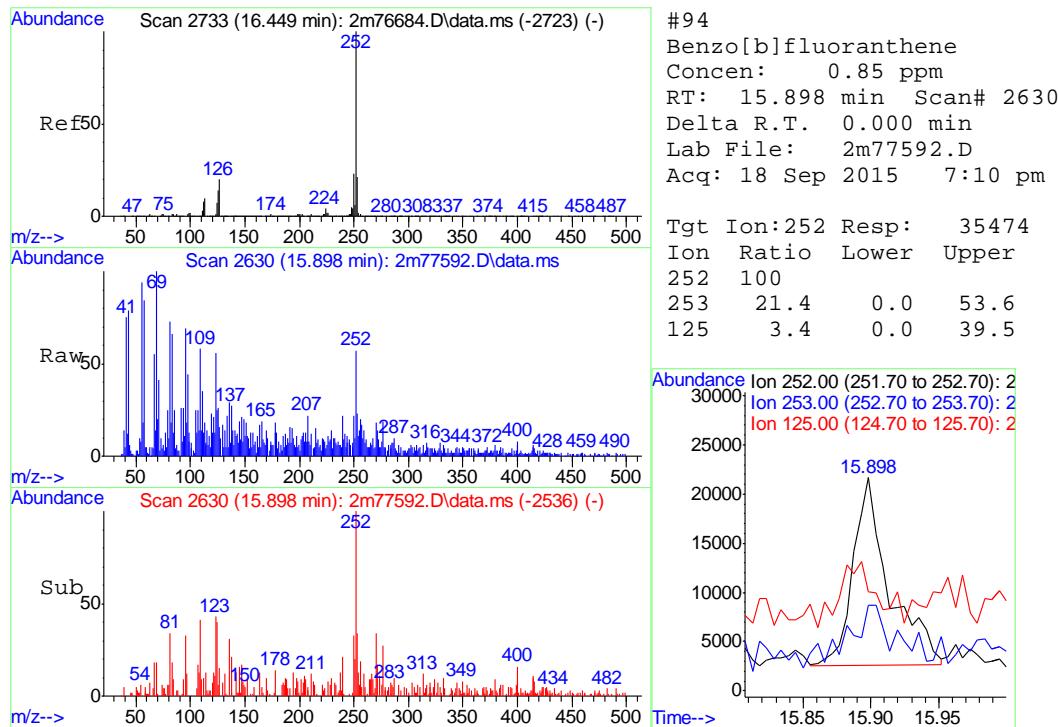


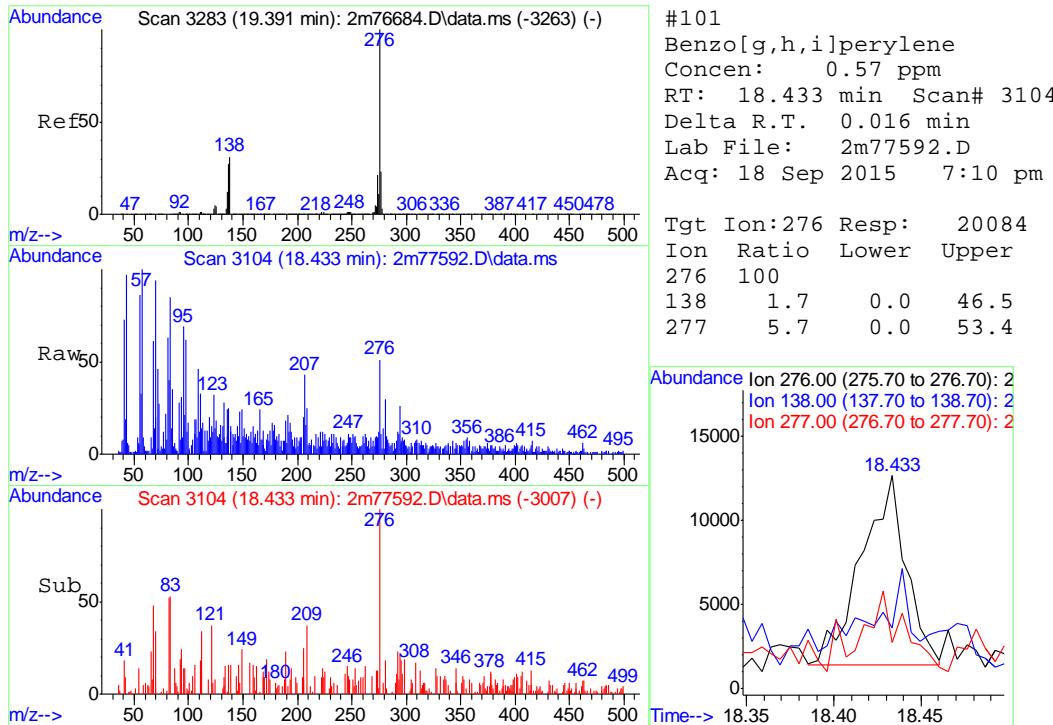










9.1.3  
9

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77588.D  
 Acq On : 18 Sep 2015 5:24 pm  
 Operator : ashleyn  
 Sample : jc4006-4  
 Misc : op87306,e2m3372,30.4  
 ALS Vial : 17 Sample Multiplier: 1

Quant Time: Sep 18 20:10:42 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

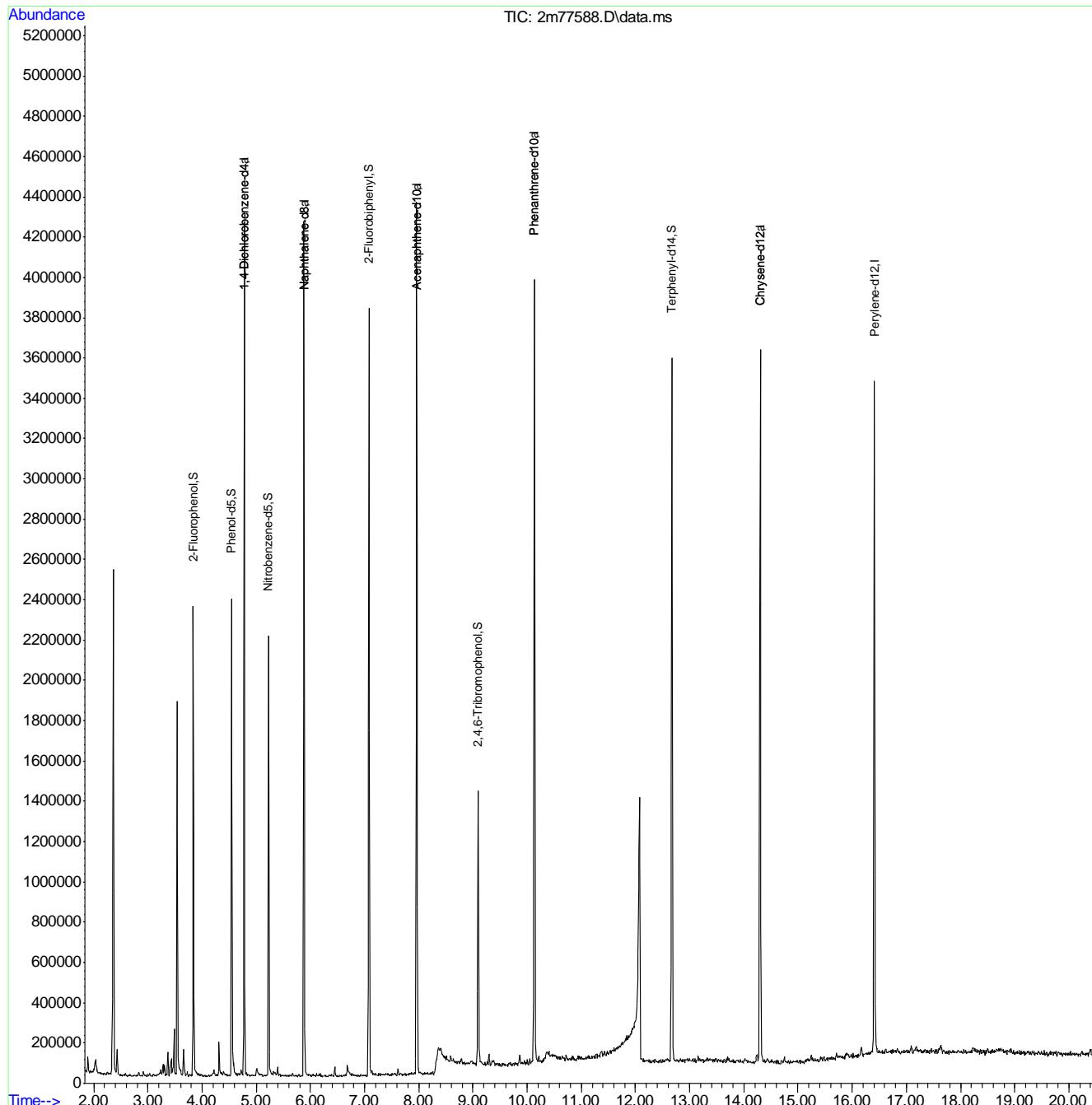
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	4.779	152	477410	40.00	ppm	0.00
24) Naphthalene-d8	5.880	136	1899514	40.00	ppm	0.00
47) Acenaphthene-d10	7.961	164	1057760	40.00	ppm	0.00
69) Phenanthrene-d10	10.132	188	1649659	40.00	ppm	0.00
83) Chrysene-d12	14.304	240	1575198	40.00	ppm	0.00
92) Perylene-d12	16.412	264	1464535	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.779	152	477410	40.00	ppm	0.00
104) Acenaphthene-d10a	7.961	164	1057760	40.00	ppm	0.00
106) Chrysene-d12a	14.304	240	1575198	40.00	ppm	0.00
108) Phenanthrene-d10a	10.132	188	1649659	40.00	ppm	0.00
110) Naphthalene-d8a	5.880	136	1899514	40.00	ppm	0.00
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.837	112	571528	34.09	ppm	0.00
Spiked Amount 50.000			Recovery	=	68.18%	
8) Phenol-d5	4.543	99	693037	31.30	ppm	0.00
Spiked Amount 50.000			Recovery	=	62.60%	
25) Nitrobenzene-d5	5.228	82	668220	31.23	ppm	0.00
Spiked Amount 50.000			Recovery	=	62.46%	
51) 2-Fluorobiphenyl	7.084	172	1259851	38.06	ppm	0.00
Spiked Amount 50.000			Recovery	=	76.12%	
73) 2,4,6-Tribromophenol	9.100	330	191359	32.10	ppm	0.00
Spiked Amount 50.000			Recovery	=	64.20%	
85) Terphenyl-d14	12.673	244	1315013	38.34	ppm	-0.01
Spiked Amount 50.000			Recovery	=	76.68%	
<hr/>						
Target Compounds						
<hr/>						

(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77588.D  
 Acq On : 18 Sep 2015 5:24 pm  
 Operator : ashley  
 Sample : jc4006-4  
 Misc : op87306,e2m3372,30.4  
 ALS Vial : 17 Sample Multiplier: 1

Quant Time: Sep 18 20:10:42 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77577.D  
 Acq On : 18 Sep 2015 12:31 pm  
 Operator : ashley  
 Sample : op87306-mb1  
 Misc : op87306,e2m3372,30.0  
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 18 16:02:20 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration

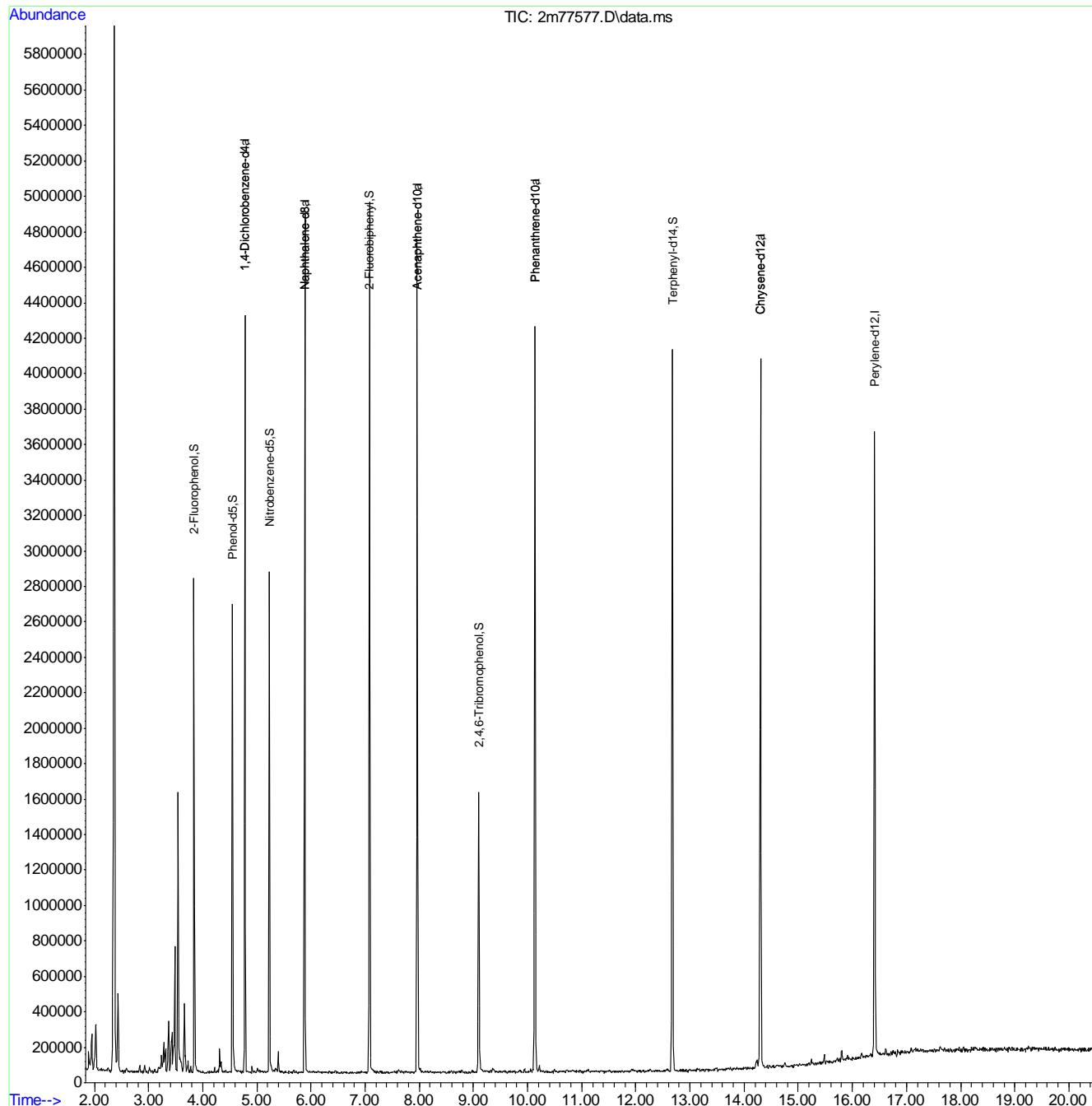
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	4.778	152	516782	40.00	ppm	0.00
24) Naphthalene-d8	5.886	136	2090085	40.00	ppm	0.00
47) Acenaphthene-d10	7.961	164	1141929	40.00	ppm	0.00
69) Phenanthrene-d10	10.138	188	1759053	40.00	ppm	0.00
83) Chrysene-d12	14.304	240	1665678	40.00	ppm	0.00
92) Perylene-d12	16.412	264	1575335	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.778	152	516782	40.00	ppm	0.00
104) Acenaphthene-d10a	7.961	164	1141929	40.00	ppm	0.00
106) Chrysene-d12a	14.304	240	1665678	40.00	ppm	0.00
108) Phenanthrene-d10a	10.138	188	1759053	40.00	ppm	0.00
110) Naphthalene-d8a	5.886	136	2090085	40.00	ppm	0.00
<hr/>						
System Monitoring Compounds						
5) 2-Fluorophenol	3.837	112	720604	39.71	ppm	0.00
Spiked Amount 50.000			Recovery	=	79.42%	
8) Phenol-d5	4.548	99	893562	37.28	ppm	0.00
Spiked Amount 50.000			Recovery	=	74.56%	
25) Nitrobenzene-d5	5.233	82	823542	34.98	ppm	0.00
Spiked Amount 50.000			Recovery	=	69.96%	
51) 2-Fluorobiphenyl	7.084	172	1559886	43.65	ppm	0.00
Spiked Amount 50.000			Recovery	=	87.30%	
73) 2,4,6-Tribromophenol	9.100	330	230879	36.32	ppm	0.00
Spiked Amount 50.000			Recovery	=	72.64%	
85) Terphenyl-d14	12.678	244	1569014	43.26	ppm	0.00
Spiked Amount 50.000			Recovery	=	86.52%	
<hr/>						
Target Compounds						
<hr/>						

(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e2m3372\  
 Data File : 2m77577.D  
 Acq On : 18 Sep 2015 12:31 pm  
 Operator : ashley  
 Sample : op87306-mb1  
 Misc : op87306,e2m3372,30.0  
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Sep 18 16:02:20 2015  
 Quant Method : C:\MSDCHEM\1\METHODS\M2M3346.M  
 Quant Title : Semi Volatile GC/MS,rxi 5sil ms 30m .25mm .25um  
 QLast Update : Fri Sep 11 15:35:15 2015  
 Response via : Initial Calibration





## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37600  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:52	MA37600-STD1	1		STDA
10:55	MA37600-STD2	1		STDB
10:59	ZZZZZZ	1		
11:01	ZZZZZZ	1		
11:05	MA37600-ICV1	1		
11:08	MA37600-ICB1	1		
11:11	MA37600-CCV1	1		
11:14	MA37600-CCB1	1		
11:17	MA37600-CRI1	1		
11:20	MA37600-CRID1	1		
11:23	MA37600-CRIA1	1		
11:26	MA37600-ICSA1	1		
11:30	MA37600-ICSAB1	1		
11:33	MA37600-CCV2	1		
11:36	MA37600-CCB2	1		
11:40	MA37600-HSTD1	1		non minerals.
11:43	MA37600-HSTD2	1		minerals.
11:46	ZZZZZZ	1		
11:49	ZZZZZZ	1		
11:52	ZZZZZZ	1		
11:55	ZZZZZZ	1		
11:58	ZZZZZZ	10		
12:01	ZZZZZZ	2		
12:04	ZZZZZZ	20		
12:07	MA37600-CCV3	1		
12:10	MA37600-CCB3	1		
12:13	ZZZZZZ	5		
12:16	ZZZZZZ	10		
12:19	ZZZZZZ	5		
12:22	ZZZZZZ	1		
12:25	MP89095-MB1	1		
12:28	MP89095-B1	1		Missing one spike.
12:31	MP89095-S1	1		

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37600  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:34	MP89095-S2	1		
12:37	MA37600-CCV4	1		
12:39	MA37600-CCB4	1		
12:42	ZZZZZZ	1		
12:45	ZZZZZZ	1		
12:48	ZZZZZZ	1		
12:51	ZZZZZZ	1		
12:54	JC4006-1	1		
12:57	JC4006-2	1		
13:00	JC4006-3	1		
13:03	JC4006-4	1		
-----> Last reportable sample/prep for job JC4006				
13:06	MA37600-CCV5	1		
13:08	MA37600-CCB5	1		
13:11	MP89110-MB1	5		CCV out
13:14	MP89110-B1	5		CCV out
13:17	MP89110-S1	5		CCV out
13:20	MP89110-S2	5		CCV out
13:23	JC4091-1A	5		(sample used for QC only; not part of login JC4006)
13:26	MP89110-SD1	25		CCV out
13:29	ZZZZZZ	5		
13:32	ZZZZZZ	5		
13:35	ZZZZZZ	5		
13:39	MA37600-CCV6	1		
13:41	MA37600-CCB6	1		
13:46	MA37600-CCV7	1		
13:49	MA37600-CCB7	1		
13:52	ZZZZZZ	5		
13:55	ZZZZZZ	5		
13:58	ZZZZZZ	5		
14:01	ZZZZZZ	5		
14:04	ZZZZZZ	5		
14:07	ZZZZZZ	5		
14:10	ZZZZZZ	5		

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37600  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:13	ZZZZZZ	5		
14:16	ZZZZZZ	5		
14:19	MA37600-CCV8	1		
14:22	MA37600-CCB8	1		
14:25	ZZZZZZ	5		
14:28	ZZZZZZ	5		
14:31	ZZZZZZ	5		
14:34	ZZZZZZ	5		
14:37	ZZZZZZ	5		
14:40	ZZZZZZ	5		
14:43	ZZZZZZ	5		
14:47	MP89110-B1	5		CCV out for Zn.
14:50	MP89110-MB1	5		CCV out for Zn.
14:53	MA37600-CCV9	1		All radial view elements high RSD
14:55	MA37600-CCB9	1		
14:58	MA37600-CCV10	1		
15:01	MA37600-CCB10	1		
15:04	ZZZZZZ	5		
15:07	ZZZZZZ	5		
15:10	ZZZZZZ	5		
15:13	MA37600-CRI2	1		
15:16	MA37600-CRID2	1		
15:19	MA37600-CRIA2	1		
15:22	MA37600-CCV11	1		
15:25	MA37600-CCB11	1		
-----> Last reportable CCB for job JC4006				
15:28	ZZZZZZ	1		
15:31	ZZZZZZ	1		
15:34	ZZZZZZ	1		
15:37	ZZZZZZ	1		
15:40	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

Date Analyzed: 09/21/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37600

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:52	MA37600-STD1	2103 R	27764 R	20990 R	6044 R
10:55	MA37600-STD2	1962	27359	20000	5118
10:59	ZZZZZZ	2012	27464	20205	5372
11:01	ZZZZZZ	2081	31401	20635	5989
11:05	MA37600-ICV1	1981	27123	20002	5306
11:08	MA37600-ICB1	2054	27123	20494	5906
11:11	MA37600-CCV1	1945	26470	19784	5219
11:14	MA37600-CCB1	2035	26920	20457	5869
11:17	MA37600-CRI1	2022	27109	20360	5778
11:20	MA37600-CRID1	2030	26991	20397	5829
11:23	MA37600-CRIA1	2027	26756	20251	5815
11:26	MA37600-ICSA1	1808	25459	18772	4488
11:30	MA37600-ICSAB1	1811	25413	18738	4520
11:33	MA37600-CCV2	2001	27119	19862	5323
11:36	MA37600-CCB2	2041	26905	20224	5858
11:40	MA37600-HSTD1	2020	26991	20218	5700
11:43	MA37600-HSTD2	1844	26519	18917	4595
11:46	ZZZZZZ	2216	26877	19871	6298
11:49	ZZZZZZ	2007	27049	20315	5786
11:52	ZZZZZZ	2052	27238	20303	5885
11:55	ZZZZZZ	1989	26800	20291	5779
11:58	ZZZZZZ	1924	27904	19499	5132
12:01	ZZZZZZ	1890	27172	19090	5132
12:04	ZZZZZZ	1892	28181	19640	5051
12:07	MA37600-CCV3	1935	27125	19794	5186
12:10	MA37600-CCB3	2016	27098	20404	5805
12:13	ZZZZZZ	No results reported for the elements associated with this internal standard.			
12:16	ZZZZZZ	1870	27813	19412	4993
12:19	ZZZZZZ	No results reported for the elements associated with this internal standard.			
12:22	ZZZZZZ	1937	27360	20050	5394
12:25	MP89095-MB1	2006	27291	20445	5818
12:28	MP89095-B1	1959	27031	19826	5371
12:31	MP89095-S1	No results reported for the elements associated with this internal standard.			

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

Date Analyzed: 09/21/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37600

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
12:34	MP89095-S2				No results reported for the elements associated with this internal standard.
12:37	MA37600-CCV4	1967	26802	19578	5214
12:39	MA37600-CCB4	2054	27045	20191	5858
12:42	ZZZZZZ	1975	27180	19906	5381
12:45	ZZZZZZ	1980	27058	19903	5438
12:48	ZZZZZZ	1983	27649	20342	5196
12:51	ZZZZZZ	1947	27534	20066	5036
12:54	JC4006-1	2009	27089	20096	5569
12:57	JC4006-2	2064	27959	20210	5382
13:00	JC4006-3	1943	27340	20064	5146
13:03	JC4006-4	2040	27515	20286	5378
13:06	MA37600-CCV5	1956	26839	19473	5210
13:08	MA37600-CCB5	2045	26873	20111	5811
13:11	MP89110-MB1				No results reported for the elements associated with this internal standard.
13:14	MP89110-B1				No results reported for the elements associated with this internal standard.
13:17	MP89110-S1				No results reported for the elements associated with this internal standard.
13:20	MP89110-S2				No results reported for the elements associated with this internal standard.
13:23	JC4091-1A				No results reported for the elements associated with this internal standard.
13:26	MP89110-SD1				No results reported for the elements associated with this internal standard.
13:29	ZZZZZZ				No results reported for the elements associated with this internal standard.
13:32	ZZZZZZ				No results reported for the elements associated with this internal standard.
13:35	ZZZZZZ				No results reported for the elements associated with this internal standard.
13:39	MA37600-CCV6	2181	26743	18351	5761
13:41	MA37600-CCB6	2059	26992	20136	5892
13:46	MA37600-CCV7	1988	27062	19597	5261
13:49	MA37600-CCB7	2042	27038	20122	5848
13:52	ZZZZZZ	1861	27834	19379	4963
13:55	ZZZZZZ	1895	28762	18878	5055
13:58	ZZZZZZ	1869	27724	19256	4940
14:01	ZZZZZZ	1851	27489	19030	4913
14:04	ZZZZZZ	1864	27916	19398	4996
14:07	ZZZZZZ	1891	27562	19188	5038
14:10	ZZZZZZ	1862	27745	19333	4974

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

Date Analyzed: 09/21/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37600

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
14:13	ZZZZZZ	1867	27585	19064	4961
14:16	ZZZZZZ	1890	27854	19351	4997
14:19	MA37600-CCV8	1983	26915	19560	5256
14:22	MA37600-CCB8	2046	26964	19994	5843
14:25	ZZZZZZ	1843	27748	19190	4888
14:28	ZZZZZZ	1879	27805	19737	4989
14:31	ZZZZZZ	1829	27456	19137	4877
14:34	ZZZZZZ	1868	27710	19340	4974
14:37	ZZZZZZ	1860	27706	19161	4899
14:40	ZZZZZZ	1813	29824	18637	4800
14:43	ZZZZZZ	1893	27738	19421	5062
14:47	MP89110-B1	1926	27777	19458	5062
14:50	MP89110-MB1	1888	28072	19473	5064
14:53	MA37600-CCV9	1939	26722	20919	5184
14:55	MA37600-CCB9	2045	26813	19173	5830
14:58	MA37600-CCV10	1978	26729	19465	5233
15:01	MA37600-CCB10	2040	27630	20047	5826
15:04	ZZZZZZ	1904	27911	19411	5062
15:07	ZZZZZZ	1899	27973	19415	5035
15:10	ZZZZZZ	1909	28009	19454	5045
15:13	MA37600-CRI2	2025	26988	19783	5730
15:16	MA37600-CRID2	2052	26935	20181	5821
15:19	MA37600-CRIA2	2041	26863	19900	5810
15:22	MA37600-CCV11	1974	26762	19482	5230
15:25	MA37600-CCB11	2053	26748	19916	5843
15:28	ZZZZZZ	2035	26864	19965	5805
15:31	ZZZZZZ	2033	26845	19974	5805
15:34	ZZZZZZ	2041	26834	19986	5840
15:37	ZZZZZZ	2028	26815	19957	5815
15:40	ZZZZZZ	2050	26788	19906	5858

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %

INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

Date Analyzed: 09/21/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37600

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
Istd#4	Indium		70-130	%	

10.1.1

10

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: RL	IDL	11:08 ICB1		11:14 CCB1		11:36 CCB2		12:10 CCB3	
			raw	final	raw	final	raw	final	raw	final
Aluminum	200	10	anr							
Antimony	6.0	2.4	anr							
Arsenic	3.0	2.5	anr							
Barium	200	.2	anr							
Beryllium	1.0	.1	anr							
Bismuth	20	2.7								
Boron	100	2								
Cadmium	3.0	.4	anr							
Calcium	5000	4.5	anr							
Chromium	10	.9	anr							
Cobalt	50	.4	0.0	<50	-0.30	<50	-0.40	<50	-0.10	<50
Copper	10	1.1	anr							
Iron	100	1.7	anr							
Lead	3.0	1.7	-1.0	<3.0	-1.6	<3.0	0.0	<3.0	-1.5	<3.0
Lithium	20	1.5								
Magnesium	5000	21	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6	anr							
Nickel	10	.5	-0.10	<10	0.20	<10	0.0	<10	-0.30	<10
Palladium	50	2								
Potassium	10000	29	anr							
Selenium	10	2.6	anr							
Silicon	200	1.9								
Silver	10	.8	anr							
Sodium	10000	9.4	anr							
Sulfur	50	4.1								
Strontium	10	.1								
Thallium	2.0	1.9	anr							
Tin	10	1.3								
Titanium	10	1.1								
Tungsten	50	1.9								
Vanadium	50	.7	0.70	<50	0.0	<50	0.60	<50	0.20	<50
Zinc	20	.3	-0.10	<20	0.20	<20	0.30	<20	-0.20	<20

10.1.2  
**10**

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Time:	11:08	11:14	11:36	12:10
Sample ID:	ICB1	CCB1	CCB2	CCB3
Metal	RL	IDL	raw	final

Zirconium      10      .3

(\*) Outside of QC limits  
(anr) Analyte not requested

10.1.2  
**10**

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: RL	IDL	12:39 CCB4		13:08 CCB5		13:41 CCB6		13:49 CCB7	
			raw	final	raw	final	raw	final	raw	final
Aluminum	200	10	anr							
Antimony	6.0	2.4	anr							
Arsenic	3.0	2.5	anr							
Barium	200	.2	anr							
Beryllium	1.0	.1	anr							
Bismuth	20	2.7								
Boron	100	2								
Cadmium	3.0	.4	anr							
Calcium	5000	4.5	anr							
Chromium	10	.9	anr							
Cobalt	50	.4	0.0	<50	0.0	<50	-0.30	<50	-0.10	<50
Copper	10	1.1	anr							
Iron	100	1.7	anr							
Lead	3.0	1.7	-1.3	<3.0	-1.3	<3.0	-0.70	<3.0	-2.3	<3.0
Lithium	20	1.5								
Magnesium	5000	21	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6	anr							
Nickel	10	.5	-0.10	<10	0.10	<10	-0.10	<10	-0.50	<10
Palladium	50	2								
Potassium	10000	29	anr							
Selenium	10	2.6	anr							
Silicon	200	1.9								
Silver	10	.8	anr							
Sodium	10000	9.4	anr							
Sulfur	50	4.1								
Strontium	10	.1								
Thallium	2.0	1.9	anr							
Tin	10	1.3								
Titanium	10	1.1								
Tungsten	50	1.9								
Vanadium	50	.7	-0.20	<50	-0.20	<50	0.60	<50	0.50	<50
Zinc	20	.3	0.20	<20	0.20	<20	0.0	<20	0.0	<20

10.1.2  
**10**

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Time: Sample ID:	12:39 CCB4	13:08 CCB5	13:41 CCB6	13:49 CCB7						
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final

Zirconium      10      .3

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: RL	IDL	14:22 CCB8		14:55 CCB9		15:01 CCB10		15:25 CCB11		final
			raw	final	raw	final	raw	final	raw	final	
Aluminum	200	10	anr								
Antimony	6.0	2.4	anr								
Arsenic	3.0	2.5	anr								
Barium	200	.2	anr								
Beryllium	1.0	.1	anr								
Bismuth	20	2.7									
Boron	100	2									
Cadmium	3.0	.4	anr								
Calcium	5000	4.5	anr								
Chromium	10	.9	anr								
Cobalt	50	.4	0.10	<50	0.0	<50	0.30	<50	0.10	<50	
Copper	10	1.1	anr								
Iron	100	1.7	anr								
Lead	3.0	1.7	-1.4	<3.0	-0.40	<3.0	0.10	<3.0	-1.1	<3.0	
Lithium	20	1.5									
Magnesium	5000	21	anr								
Manganese	15	.1	anr								
Molybdenum	20	.6	anr								
Nickel	10	.5	-0.20	<10	0.0	<10	-0.10	<10	0.0	<10	
Palladium	50	2									
Potassium	10000	29	anr								
Selenium	10	2.6	anr								
Silicon	200	1.9									
Silver	10	.8	anr								
Sodium	10000	9.4	anr								
Sulfur	50	4.1									
Strontium	10	.1									
Thallium	2.0	1.9	anr								
Tin	10	1.3									
Titanium	10	1.1									
Tungsten	50	1.9									
Vanadium	50	.7	0.70	<50	0.20	<50	0.20	<50	0.20	<50	
Zinc	20	.3	0.10	<20	0.10	<20	-0.10	<20	0.10	<20	

10.1.2  
**10**

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37600      Units: ug/l

Time: Sample ID:	14:22 CCB8	14:55 CCB9	15:01 CCB10	15:25 CCB11						
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final

Zirconium      10      .3

(\*) Outside of QC limits  
(anr) Analyte not requested

10.1.2  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 90 to 110 % Recovery      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: True	11:05 ICV1 Results		CCV True	11:11 CCV1 Results		CCV True	11:33 CCV2 Results	
		% Rec			% Rec			% Rec	
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	2000	2070	103.5	2000	2110	105.5	2000	2090	104.5
Copper	anr								
Iron	anr								
Lead	2000	2070	103.5	2000	2110	105.5	2000	2100	105.0
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	2000	2070	103.5	2000	2110	105.5	2000	2090	104.5
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	2040	102.0	2000	2100	105.0	2000	2060	103.0
Zinc	2000	2110	105.5	2000	2150	107.5	2000	2120	106.0

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	11:05	11:11	11:33	
Sample ID:	ICV	CCV1	CCV2	
Metal	True	Results % Rec	True	Results % Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.1.3  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 90 to 110 % Recovery      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: True	12:07 CCV Results		12:37 CCV True		13:06 CCV True			
		CCV3	% Rec	CCV4	Results	% Rec	CCV5	% Rec	
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	2000	2100	105.0	2000	2120	106.0	2000	2130	106.5
Copper	anr								
Iron	anr								
Lead	2000	2110	105.5	2000	2130	106.5	2000	2140	107.0
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	2000	2100	105.0	2000	2130	106.5	2000	2140	107.0
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	2060	103.0	2000	2090	104.5	2000	2100	105.0
Zinc	2000	2110	105.5	2000	2140	107.0	2000	2170	108.5

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	12:07	12:37	13:06	
Metal	Sample ID: CCV	Results CCV3	Results CCV4	Results CCV5
	True	% Rec	True	% Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.1.3  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 90 to 110 % Recovery      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: True	13:39 CCV Results		13:46 CCV Results		14:19 CCV Results	
		CCV6	% Rec	CCV7	% Rec	CCV8	% Rec
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Chromium	anr						
Cobalt	2000	1940	97.0	2000	2140	107.0	2000
Copper	anr						
Iron	anr						
Lead	2000	1960	98.0	2000	2160	108.0	2000
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum	anr						
Nickel	2000	1950	97.5	2000	2160	108.0	2000
Palladium							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Sulfur							
Strontium							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	2000	2120	106.0	2000	2110	105.5	2000
Zinc	2000	1990	99.5	2000	2200	110.0	2000
							2210
							110.5*(a)

10.1.3  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	13:39	13:46	14:19								
Metal	Sample ID:	Results	% Rec	True	CCV	Results	% Rec	True	CCV	Results	% Rec
Zirconium	CCV	CCV6	CCV	CCV7	CCV	CCV8					

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested  
(a) No samples reported for this element in the area bracketed by this QC.

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 90 to 110 % Recovery      Run ID: MA37600      Units: ug/l

Metal	Time: Sample ID: True	14:53 CCV Results		14:58 CCV Results		15:22 CCV Results	
		CCV9	% Rec	CCV10	% Rec	CCV11	% Rec
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Bismuth							
Boron							
Cadmium	anr						
Calcium	anr						
Chromium	anr						
Cobalt	2000	2150	107.5	2000	2150	107.5	2000
Copper	anr						
Iron	anr						
Lead	2000	2160	108.0	2000	2170	108.5	2000
Lithium							
Magnesium	anr						
Manganese	anr						
Molybdenum	anr						
Nickel	2000	2170	108.5	2000	2170	108.5	2000
Palladium							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Sulfur							
Strontium							
Thallium	anr						
Tin							
Titanium							
Tungsten							
Vanadium	2000	2120	106.0	2000	2120	106.0	2000
Zinc	2000	2210	110.5*(a	2000	2200	110.0	2000

10.1.3  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	14:53	14:58	15:22								
Metal	Sample ID:	Results	% Rec	True	CCV	CCV9	CCV10	CCV	CCV11	Results	% Rec
Zirconium	CCV										

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested  
(a) No samples reported for this element in the area bracketed by this QC.

## HIGH STANDARD CHECK SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	11:40	HSTD	HSTD1	HSTD	11:43	HSTD	HSTD2
Metal	Sample ID:	True	Results	% Rec	True	Results	% Rec

Aluminum

Antimony anr

Arsenic anr

Barium anr

Beryllium anr

Bismuth

Boron

Cadmium anr

Calcium

Chromium anr

Cobalt 5000 5240 104.8

Copper anr

Iron

Lead 5000 5280 105.6

Lithium

Magnesium

Manganese anr

Molybdenum anr

Nickel 5000 5250 105.0

Palladium

Potassium

Selenium anr

Silicon

Silver anr

Sodium

Sulfur

Strontium

Thallium anr

Tin

Titanium

Tungsten

Vanadium 5000 5230 104.6

Zinc 5000 5460 109.2

10.1.4

10

HIGH STANDARD CHECK SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: 90 to 110 % Recovery

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	11:40	11:43				
Sample ID:	HSTD	HSTD1	HSTD	HSTD2		
Metal	True	Results	% Rec	True	Results	% Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.1.4  
10

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP

QC Limits: CRI 70-130% CRIA 70-130%

Date Analyzed: 09/21/15

Run ID: MA37600

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Metal	Time:	Sample ID: CRI True	CRIA True	CRID True	11:17 CRI1L Results		11:20 CRIDL Results		11:23 CRIA1L Results	
						% Rec		% Rec		% Rec
Aluminum	200	500	100		anr					
Antimony	6.0	20	3.0		anr					
Arsenic	8.0	20	3.0		anr					
Barium	200		4.0		anr					
Beryllium	2.0		1.0		anr					
Bismuth	20									
Boron	100		10							
Cadmium	3.0		1.0		anr					
Calcium	5000	2000	1000		anr					
Chromium	10		2.0		anr					
Cobalt	50		3.0	50.7	101.4	2.8	93.3			
Copper	10		2.0		anr					
Iron	100	500			anr					
Lead	3.0	20	2.5	3.6	120.0	1.0U	0.0* (a)	21.5	107.5	
Lithium	20									
Magnesium	5000	2000	100		anr					
Manganese	15		3.0		anr					
Molybdenum	20				anr					
Nickel	10		4.0	9.9	99.0	4.0	100.0			
Palladium	50									
Potassium	5000		2000		anr					
Selenium	10	20	5.0		anr					
Silicon	200									
Silver	5.0		2.0		anr					
Sodium	5000		1000		anr					
Sulfur	50									
Strontium	10									
Thallium	10		2.0		anr					
Tin	10									
Titanium	10									
Tungsten	50									
Vanadium	50		2.0	49.6	99.2	2.4	120.0			
Zinc	20		10	23.2	116.0	11.8	118.0			

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: CRI 70-130%    CRIA 70-130%      Run ID: MA37600      Units: ug/l

Metal	Time:		11:17		11:20		11:23								
	Sample ID:	Metal	CRI	CRI	CRID	Results	% Rec	CRI	CRID	Results	% Rec	CRI	CRID	Results	% Rec
Zirconium		10													

(\*) Outside of QC limits

(anr) Analyte not requested

(a) No samples reported for this element at this RL in the area bracketed by this QC.

10.1.5  
**10**

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
 QC Limits: CRI 70-130%    CRIA 70-130%      Run ID: MA37600      Units: ug/l

Metal	Time:			15:13		15:16		15:19			
	Sample ID:	CRI	CRIA	CRID	CRI2	Results	% Rec	CRID2	CRIA2	Results	% Rec
Aluminum	200	500	100		anr						
Antimony	6.0	20		3.0	anr						
Arsenic	8.0	20		3.0	anr						
Barium	200			4.0	anr						
Beryllium	2.0			1.0	anr						
Bismuth	20										
Boron	100			10							
Cadmium	3.0			1.0	anr						
Calcium	5000	2000	1000		anr						
Chromium	10			2.0	anr						
Cobalt	50			3.0	52.6	105.2	2.9		96.7		
Copper	10			2.0	anr						
Iron	100	500			anr						
Lead	3.0	20	2.5	3.5		116.7	1.4U	0.0* (a)	22.5		112.5
Lithium	20										
Magnesium	5000	2000	100		anr						
Manganese	15			3.0	anr						
Molybdenum	20				anr						
Nickel	10			4.0	10.9	109.0	4.3		107.5		
Palladium	50										
Potassium	5000		2000		anr						
Selenium	10	20	5.0		anr						
Silicon	200										
Silver	5.0			2.0	anr						
Sodium	5000		1000		anr						
Sulfur	50										
Strontium	10										
Thallium	10			2.0	anr						
Tin	10										
Titanium	10										
Tungsten	50										
Vanadium	50			2.0	50.9	101.8	2.3		115.0		
Zinc	20			10	24.5	122.5	12.4		124.0		

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: CRI 70-130%    CRIA 70-130%      Run ID: MA37600      Units: ug/l

Metal	Time:		15:13		15:16		15:19			
	Sample ID:	Metal	CRI	CRIA	CRID	CRI2	CRID2	CRIA2		
Zirconium	True	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec

Zirconium 10

(\*) Outside of QC limits  
(anr) Analyte not requested  
(a) No samples reported for this element at this RL in the area bracketed by this QC.

10.1.5  
**10**

**INTERFERING ELEMENT CHECK STANDARDS SUMMARY**  
**Part 1 - ICSA and ICSAB Standards**

Login Number: JC4006  
 Account: SECORPAE - Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP      Date Analyzed: 09/21/15      Methods: EPA 200.7, SW846 6010C  
 QC Limits: 80 to 120 % Recovery      Run ID: MA37600      Units: ug/l

Metal	Time:		11:26		11:30		
	Sample ID:	ICSA	ICSA1	Results	% Rec	ICSA1	Results
Aluminum	500000	500000	527000	105.4	511000	102.2	
Antimony		1000	0.80		1110	111.0	
Arsenic		1000	-2.9		1030	103.0	
Barium		500	-0.40		524	104.8	
Beryllium		500	-0.10		505	101.0	
Bismuth		500	6.9		516	103.2	
Boron			-1.3		-5.8		
Cadmium		1000	2.5		1070	107.0	
Calcium	400000	400000	384000	96.0	382000	95.5	
Chromium		500	-1.1		524	104.8	
Cobalt		500	1.1		507	101.4	
Copper		500	-2.4		565	113.0	
Iron	200000	200000	185000	92.5	185000	92.5	
Lead		1000	-1.4		967	96.7	
Lithium		500	5.5		557	111.4	
Magnesium	500000	500000	529000	105.8	512000	102.4	
Manganese		500	-4.6		523	104.6	
Molybdenum		500	-0.40		505	101.0	
Nickel		1000	3.0		985	98.5	
Palladium		500	34.7		630	126.0*(a)	
Potassium			171		176		
Selenium		1000	1.0		1080	108.0	
Silicon			0.70		-4.4		
Silver		1000	4.6		1090	109.0	
Sodium			-17		-8.5		
Sulfur		500	39.1		550	110.0	
Strontium			5.1		5.0		
Thallium		1000	-3.4		976	97.6	
Tin			-4.1		-5.2		
Titanium			-0.30		1.1		
Tungsten		500	0.60		510	102.0	
Vanadium		500	1.9		529	105.8	
Zinc		1000	11.8		974	97.4	

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SE092115M1.ICP  
QC Limits: 80 to 120 % Recovery

Date Analyzed: 09/21/15  
Run ID: MA37600

Methods: EPA 200.7, SW846 6010C  
Units: ug/l

Time:	Sample ID:	ICSA	ICSAB	11:26	ICSA1	11:30	ICSAB1
Metal		True		Results	% Rec	Results	% Rec

Zirconium            500            -33\* (a)            365            73.0\*(a)

(\* ) Outside of QC limits  
(anr) Analyte not requested  
(a) No samples reported for this element in the area bracketed by this QC.

10.1.6  
**10**

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:20	MA37610-STD1	1		STDA
10:26	MA37610-STD2	1		STDB
10:32	ZZZZZZ	1		
10:38	ZZZZZZ	1		
10:45	MA37610-ICV1	1		
10:59	MA37610-ICB1	1		
11:04	MA37610-ICCV1	1		
11:23	MA37610-CCB1	1		
11:27	MA37610-CRI1	1		
11:33	MA37610-CRID1	1		
11:39	MA37610-CRIA1	1		
11:45	MA37610-ICSA1	1		
11:52	MA37610-ICSAB1	1		
11:58	MA37610-HSTD1	1		
12:04	MA37610-HSTD2	1		
12:10	MA37610-CCV1	1		
12:16	MA37610-CCB2	1		
12:22	ZZZZZZ	1		
12:29	ZZZZZZ	1		
12:35	ZZZZZZ	1		
12:41	ZZZZZZ	5		
12:47	ZZZZZZ	5		
12:53	ZZZZZZ	5		
12:59	ZZZZZZ	5		
13:05	ZZZZZZ	5		
13:11	MA37610-CCV2	1		
13:17	MA37610-CCB3	1		
13:23	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:35	ZZZZZZ	1		
13:41	MP89119-S1	1		
13:47	MP89119-S2	1		
13:53	JC4090-1	1		(sample used for QC only; not part of login JC4006)

10.2  
10

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:59	MP89119-SD1	5		
14:05	ZZZZZZ	1		
14:11	ZZZZZZ	1		
14:17	MA37610-CCV3	1		
14:23	MA37610-CCB4	1		
14:29	ZZZZZZ	1		
14:35	ZZZZZZ	1		
14:41	ZZZZZZ	1		
14:47	ZZZZZZ	1		
14:53	ZZZZZZ	1		
14:59	ZZZZZZ	1		
15:05	ZZZZZZ	1		
15:11	ZZZZZZ	1		
15:17	ZZZZZZ	1		
15:23	MA37610-CCV4	1		
15:28	MA37610-CCB5	1		
15:34	ZZZZZZ	1		
15:40	ZZZZZZ	1		
15:46	ZZZZZZ	1		
15:52	ZZZZZZ	1		
15:58	ZZZZZZ	1		
16:04	ZZZZZZ	1		
16:10	ZZZZZZ	1		
16:16	ZZZZZZ	1		
16:22	MP89095-S1	1		
16:29	MA37610-CCV5	1		
16:35	MA37610-CCB6	1		
16:41	MP89095-S2	1		
16:47	JC3239-2	1		(sample used for QC only; not part of login JC4006)
16:53	MP89095-SD1	5		
-----> Last reportable sample/prep for job JC4006				
16:59	ZZZZZZ	1		
17:05	ZZZZZZ	1		
17:11	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:17	ZZZZZZ	1		
17:23	ZZZZZZ	1		
17:29	ZZZZZZ	1		
17:35	MA37610-CCV6	1		
17:41	MA37610-CCB7	1		
17:47	ZZZZZZ	1		
17:53	ZZZZZZ	1		
17:59	ZZZZZZ	1		
18:05	MP89135-B1	1		
18:11	MP89135-MB1	1		
18:17	MP89135-S1	1		
18:23	MP89135-S2	1		
18:29	JC4159-9	1		(sample used for QC only; not part of login JC4006)
18:35	MP89135-SD1	5		
18:41	MA37610-CCV7	1		
18:47	MA37610-CCB8	1		
18:53	MA37610-CRI2	1		
18:59	MA37610-CRID2	1		
19:05	MA37610-CRIA2	1		
19:11	MA37610-ICSA2	1		
19:17	MA37610-ICSAB2	1		
19:24	MA37610-CCV8	1		
19:29	MA37610-CCB9	1		
-----> Last reportable CCB for job JC4006				
19:36	ZZZZZZ	1		
19:42	ZZZZZZ	1		
19:48	ZZZZZZ	1		
19:54	ZZZZZZ	1		
20:00	ZZZZZZ	1		
20:06	ZZZZZZ	1		
20:12	ZZZZZZ	1		
20:18	ZZZZZZ	1		
20:24	ZZZZZZ	1		
20:30	MA37610-CCV9	1		

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:36	MA37610-CCB10	1		
20:42	ZZZZZZ	1		
20:48	ZZZZZZ	1		
20:54	ZZZZZZ	1		
21:00	ZZZZZZ	1		
21:06	ZZZZZZ	1		
21:12	ZZZZZZ	1		
21:18	ZZZZZZ	1		
21:24	ZZZZZZ	1		
21:30	ZZZZZZ	1		
21:36	MA37610-CCV10	1		
21:42	MA37610-CCB11	1		
21:48	ZZZZZZ	1		
21:54	ZZZZZZ	5		
22:00	ZZZZZZ	20		
22:06	ZZZZZZ	1		
22:12	ZZZZZZ	3		
22:18	ZZZZZZ	1		
22:24	MP89102-S1	1		
22:30	MP89102-S1	2		
22:36	MP89102-S2	1		
22:42	MA37610-CCV11	1		
22:48	MA37610-CCB12	1		
22:54	MP89102-S2	2		
23:00	JC3981-1F	1		(sample used for QC only; not part of login JC4006)
23:06	JC3981-1F	2		(sample used for QC only; not part of login JC4006)
23:12	MP89102-SD1	5		
23:18	MP89102-SD1	10		
23:24	ZZZZZZ	1		
23:30	ZZZZZZ	5		
23:36	ZZZZZZ	5		
23:42	ZZZZZZ	20		
23:48	MA37610-CCV12	1		

10.2  
10

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:54	MA37610-CCB13	1		
00:00	ZZZZZZ	5		
00:06	ZZZZZZ	20		
00:12	ZZZZZZ	10		
00:18	ZZZZZZ	5		
00:24	ZZZZZZ	20		
00:30	ZZZZZZ	5		
00:36	ZZZZZZ	20		
00:43	ZZZZZZ	2		
00:49	ZZZZZZ	1		
00:55	MA37610-CCV13	1		
01:01	MA37610-CCB14	1		
01:07	MP89140-MB1	1		
01:13	MP89140-MB2	1		
01:19	MP89140-B1	1		
01:24	MP89140-B2	1		
01:30	MP89140-S1	1		
01:36	MP89140-S2	1		
01:42	JC4274-4	1		(sample used for QC only; not part of login JC4006)
01:48	MP89140-SD1	5		
01:54	ZZZZZZ	1		
02:00	MA37610-CCV14	1		
02:06	MA37610-CCB15	1		
02:12	MA37610-CRI3	1		
02:18	MA37610-CRID3	1		
02:24	MA37610-CRIA3	1		
02:30	MA37610-ICSA3	1		
02:36	MA37610-ICSAB3	1		
02:42	ZZZZZZ	1		
02:48	ZZZZZZ	1		
02:54	MA37610-CCV15	1		
03:00	MA37610-CCB16	1		
03:06	ZZZZZZ	1		

10.2  
10

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
03:12	ZZZZZZ	1		
03:18	ZZZZZZ	1		
03:24	ZZZZZZ	1		
03:31	ZZZZZZ	1		
03:37	ZZZZZZ	1		
03:43	ZZZZZZ	1		
03:49	ZZZZZZ	1		
03:55	ZZZZZZ	1		
04:01	MA37610-CCV16	1		
04:07	MA37610-CCB17	1		
04:13	ZZZZZZ	1		
04:19	ZZZZZZ	1		
04:25	ZZZZZZ	1		
04:31	ZZZZZZ	1		
04:37	ZZZZZZ	1		
04:43	ZZZZZZ	1		
04:49	ZZZZZZ	1		
04:55	ZZZZZZ	1		
05:01	ZZZZZZ	1		
05:07	MA37610-CCV17	1		
05:13	MA37610-CCB18	1		
05:19	ZZZZZZ	1		
05:25	ZZZZZZ	1		
05:31	ZZZZZZ	1		
05:37	ZZZZZZ	1		
05:43	ZZZZZZ	1		
05:48	ZZZZZZ	1		
05:54	ZZZZZZ	1		
06:00	ZZZZZZ	1		
06:06	ZZZZZZ	1		
06:12	MA37610-CCV18	1		
06:18	MA37610-CCB19	1		
06:24	MP89141-MB1	1		batch to reanalyze for Be, Y 3710 out for CRID

10.2  
10

Accutest Laboratories Instrument Runlog  
Inorganics Analyses

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:30	MP89141-MB2	1		
06:36	MP89141-B1	1		
06:42	MP89141-B2	1		
06:48	MP89141-S1	1		
06:54	MP89141-S2	1		
07:00	JC4099-1	1		(sample used for QC only; not part of login JC4006)
07:06	MP89141-SD1	5		
07:12	ZZZZZ	1		
07:18	MA37610-CCV19	1		
07:24	MA37610-CCB20	1		
07:30	MA37610-CRI4	1		
07:36	MA37610-CRID4	1		
07:42	MA37610-CRIA4	1		
07:48	MA37610-CCV20	1		
07:54	MA37610-CCB21	1		

Refer to raw data for calibration curve and standards.

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PAFile ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
Analyst: BS      Run ID: MA37610  
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:20	MA37610-STD1	2689 R	176360 R	33326 R	7615 R
10:26	MA37610-STD2	2528	161120	32830	6724
10:32	ZZZZZZ	2585	166310	32837	6941
10:38	ZZZZZZ	2681	175420	33177	7625
10:45	MA37610-ICV1	2592	166830	32160	6972
10:59	MA37610-ICB1	2698	175300	33403	7666
11:04	MA37610-ICCV1	2599	167060	32613	7043
11:23	MA37610-CCB1	2694	176680	32927	7757
11:27	MA37610-CRI1	2662	174510	32774	7569
11:33	MA37610-CRID1	2690	175800	33002	7707
11:39	MA37610-CRIA1	2683	175120	32966	7673
11:45	MA37610-ICSA1	2398	154880	31820	6231
11:52	MA37610-ICSAB1	2392	155450	31738	6269
11:58	MA37610-HSTD1	2666	170670	33156	7653
12:04	MA37610-HSTD2	2443	158130	32040	6312
12:10	MA37610-CCV1	2603	168570	32876	7082
12:16	MA37610-CCB2	2691	177110	33179	7753
12:22	ZZZZZZ	2659	173860	33067	7762
12:29	ZZZZZZ	2659	177800	33129	7769
12:35	ZZZZZZ	2747	179520	34069	7987
12:41	ZZZZZZ	2339	149290	32184	5897
12:47	ZZZZZZ	2439	155140	32249	6167
12:53	ZZZZZZ	2564	164010	32741	6781
12:59	ZZZZZZ	2319	148460	31988	5891
13:05	ZZZZZZ	2411	153180	32084	6167
13:11	MA37610-CCV2	2597	167900	32776	7064
13:17	MA37610-CCB3	2691	176690	33060	7753
13:23	ZZZZZZ	2697	178150	33607	7778
13:29	ZZZZZZ	2699	177460	33440	7752
13:35	ZZZZZZ	2633	171510	33348	7269
13:41	MP89119-S1	2546	166750	33061	6882
13:47	MP89119-S2	2548	166010	32973	6878
13:53	JC4090-1	2591	170220	33105	7082

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

Date Analyzed: 09/22/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37610

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:59	MP89119-SD1	2657	175100	33319	7569
14:05	ZZZZZZ	2592	170840	33126	7206
14:11	ZZZZZZ	2578	170860	33330	7201
14:17	MA37610-CCV3	2598	168150	32841	7101
14:23	MA37610-CCB4	2694	176620	33016	7767
14:29	ZZZZZZ	2531	167990	33053	6937
14:35	ZZZZZZ	2605	172420	33189	7168
14:41	ZZZZZZ	2491	164690	32753	6711
14:47	ZZZZZZ	2563	166680	33058	7064
14:53	ZZZZZZ	2576	158600	33619	7076
14:59	ZZZZZZ	2626	170980	33347	7095
15:05	ZZZZZZ	2586	168440	33366	7061
15:11	ZZZZZZ	2582	168620	33254	7021
15:17	ZZZZZZ	2705	176670	33479	7736
15:23	MA37610-CCV4	2615	166740	32683	7059
15:28	MA37610-CCB5	2710	175680	33180	7737
15:34	ZZZZZZ	2634	170850	33251	7230
15:40	ZZZZZZ	2642	170460	33047	7267
15:46	ZZZZZZ	2667	172840	33444	7373
15:52	ZZZZZZ	2552	165890	33566	6892
15:58	ZZZZZZ	2600	168860	33598	7003
16:04	ZZZZZZ	2607	170850	33353	7131
16:10	ZZZZZZ	2721	178470	33820	7807
16:16	ZZZZZZ	2645	169270	33184	7236
16:22	MP89095-S1	2598	167950	33757	6806
16:29	MA37610-CCV5	2621	168600	32728	7138
16:35	MA37610-CCB6	2714	176960	33171	7785
16:41	MP89095-S2	2612	169210	33862	6883
16:47	JC3239-2	2676	174780	34489	7050
16:53	MP89095-SD1	2700	175380	33357	7467
16:59	ZZZZZZ	2740	177150	33982	7569
17:05	ZZZZZZ	2726	176850	33992	7464
17:11	ZZZZZZ	2737	177260	34099	7531

## INTERNAL STANDARD SUMMARY

Login Number: JC4006  
 Account: SECORPAE - Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
 Analyst: BS      Run ID: MA37610  
 Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
17:17	ZZZZZZ	2667	173200	34734	7376
17:23	ZZZZZZ	2636	172320	34199	7384
17:29	ZZZZZZ	2739	177530	34405	7547
17:35	MA37610-CCV6	2616	167400	32879	7084
17:41	MA37610-CCB7	2712	177080	33065	7783
17:47	ZZZZZZ	2751	178050	34006	7600
17:53	ZZZZZZ	2740	176800	34039	7515
17:59	ZZZZZZ	2722	177930	33518	7813
18:05	MP89135-B1	2649	170490	33225	7288
18:11	MP89135-MB1	2711	178850	33690	7791
18:17	MP89135-S1	2650	170870	34599	6988
18:23	MP89135-S2	2662	171570	34664	7013
18:29	JC4159-9	2706	176310	35184	7186
18:35	MP89135-SD1	2732	177160	33811	7542
18:41	MA37610-CCV7	2616	168140	32766	7096
18:47	MA37610-CCB8	2712	177410	33112	7786
18:53	MA37610-CRI2	2672	174210	32963	7579
18:59	MA37610-CRID2	2681	173450	32957	7683
19:05	MA37610-CRIA2	2674	175900	32984	7684
19:11	MA37610-ICSA2	2398	155160	31840	6256
19:17	MA37610-ICSAB2	2391	154490	31766	6251
19:24	MA37610-CCV8	2611	167490	32627	7058
19:29	MA37610-CCB9	2700	176480	33143	7743
19:36	ZZZZZZ	2560	168300	33358	7859
19:42	ZZZZZZ	2577	171940	33797	7379
19:48	ZZZZZZ	2607	169270	33620	7189
19:54	ZZZZZZ	2686	174440	34130	7352
20:00	ZZZZZZ	2595	169000	33794	7123
20:06	ZZZZZZ	2666	172960	34120	7335
20:12	ZZZZZZ	2613	999999 !a	34297	7418
20:18	ZZZZZZ	2639	171950	33788	7562
20:24	ZZZZZZ	2706	175900	34492	7281
20:30	MA37610-CCV9	2618	166620	32571	7046

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

Date Analyzed: 09/22/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37610

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:36	MA37610-CCB10	2709	175400	32757	7727
20:42	ZZZZZZ	2743	177550	34689	7263
20:48	ZZZZZZ	2480	172410	34622	7125
20:54	ZZZZZZ	2718	175630	33681	7447
21:00	ZZZZZZ	2702	175460	34684	7139
21:06	ZZZZZZ	2694	172720	34390	7061
21:12	ZZZZZZ	2740	178330	34135	7339
21:18	ZZZZZZ	2677	177150	34378	7476
21:24	ZZZZZZ	2757	179490	34732	7350
21:30	ZZZZZZ	2667	175350	34106	7217
21:36	MA37610-CCV10	2594	168200	32314	7093
21:42	MA37610-CCB11	2678	176830	32494	7767
21:48	ZZZZZZ	2691	177420	32997	7765
21:54	ZZZZZZ	2583	169220	32413	7156
22:00	ZZZZZZ	2593	169670	32294	7166
22:06	ZZZZZZ	2681	178760	33111	7820
22:12	ZZZZZZ	2532	167150	32274	6807
22:18	ZZZZZZ	2676	177490	32956	7786
22:24	MP89102-S1	2512	165050	32335	6834
22:30	MP89102-S1	2583	170120	32641	7109
22:36	MP89102-S2	2519	165330	32538	6838
22:42	MA37610-CCV11	2588	168070	32169	7084
22:48	MA37610-CCB12	2682	177460	32613	7786
22:54	MP89102-S2	2583	170160	32525	7115
23:00	JC3981-1F	2524	167490	32365	6945
23:06	JC3981-1F	2581	170770	32430	7200
23:12	MP89102-SD1	2630	173770	32529	7494
23:18	MP89102-SD1	2657	175930	32731	7639
23:24	ZZZZZZ	2678	178970	33019	7784
23:30	ZZZZZZ	2609	169910	32459	7143
23:36	ZZZZZZ	2471	999999 !a	31934	6431
23:42	ZZZZZZ	2590	169500	32378	7089
23:48	MA37610-CCV12	2592	168760	32383	7111

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

Date Analyzed: 09/22/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37610

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
23:54	MA37610-CCB13	2685	177740	32751	7783
00:00	ZZZZZZ	2432	156750	31637	6175
00:06	ZZZZZZ	2569	166220	32157	6882
00:12	ZZZZZZ	2586	169680	32558	7106
00:18	ZZZZZZ	2346	150440	30938	6007
00:24	ZZZZZZ	2515	163880	32108	6742
00:30	ZZZZZZ	2462	157070	31803	6177
00:36	ZZZZZZ	2557	166260	32139	6845
00:43	ZZZZZZ	2619	173530	32918	7322
00:49	ZZZZZZ	2644	175400	33123	7457
00:55	MA37610-CCV13	2593	168960	32451	7097
01:01	MA37610-CCB14	2684	177390	32534	7785
01:07	MP89140-MB1	2684	178360	33183	7803
01:13	MP89140-MB2	2679	179050	33212	7800
01:19	MP89140-B1	2625	172210	33159	7296
01:24	MP89140-B2	2616	171260	32811	7276
01:30	MP89140-S1	2575	169120	32803	7052
01:36	MP89140-S2	2573	168390	32603	7030
01:42	JC4274-4	2609	172660	32722	7266
01:48	MP89140-SD1	2661	176470	32793	7655
01:54	ZZZZZZ	2675	176890	33823	7564
02:00	MA37610-CCV14	2599	169420	32345	7139
02:06	MA37610-CCB15	2691	178430	32564	7798
02:12	MA37610-CRI3	2665	175950	32614	7634
02:18	MA37610-CRID3	2689	177940	999999 !a	7793
02:24	MA37610-CRIA3	2683	178300	32750	7766
02:30	MA37610-ICSA3	2396	156790	31457	6304
02:36	MA37610-ICSAB3	2389	156650	31373	6314
02:42	ZZZZZZ	2698	178890	32722	7843
02:48	ZZZZZZ	2679	177400	32437	7778
02:54	MA37610-CCV15	2598	169250	32145	7121
03:00	MA37610-CCB16	2685	177420	32663	7806
03:06	ZZZZZZ	2688	178160	32498	7769

10.2.1  
10

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

Date Analyzed: 09/22/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37610

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
03:12	ZZZZZZ	2679	177410	32509	7789
03:18	ZZZZZZ	2701	178370	32682	7807
03:24	ZZZZZZ	2680	178350	32517	7755
03:31	ZZZZZZ	2687	177800	32539	7807
03:37	ZZZZZZ	2739	169640	33414	7033
03:43	ZZZZZZ	2468	163450	31325	6747
03:49	ZZZZZZ	2476	162680	31372	6749
03:55	ZZZZZZ	2664	178680	32264	7752
04:01	MA37610-CCV16	2590	168820	31902	7098
04:07	MA37610-CCB17	2686	177480	32542	7807
04:13	ZZZZZZ	2691	178110	33433	7621
04:19	ZZZZZZ	2678	177720	33334	7646
04:25	ZZZZZZ	2588	171220	32792	7171
04:31	ZZZZZZ	2633	174270	32730	7473
04:37	ZZZZZZ	2599	171120	32275	7267
04:43	ZZZZZZ	2704	175990	32734	7772
04:49	ZZZZZZ	2636	173270	32258	7456
04:55	ZZZZZZ	2691	178030	32382	7837
05:01	ZZZZZZ	2617	172690	32391	7375
05:07	MA37610-CCV17	2595	167820	31831	7117
05:13	MA37610-CCB18	2689	177240	32021	7813
05:19	ZZZZZZ	2588	170700	32200	7231
05:25	ZZZZZZ	2639	174470	32380	7467
05:31	ZZZZZZ	2612	999999 !a	32225	7357
05:37	ZZZZZZ	2604	170930	32334	7262
05:43	ZZZZZZ	2622	173830	32649	7458
05:48	ZZZZZZ	2606	171440	32022	7301
05:54	ZZZZZZ	2670	175060	32475	7688
06:00	ZZZZZZ	2646	175040	32485	7512
06:06	ZZZZZZ	2695	178970	32889	7856
06:12	MA37610-CCV18	2589	168770	32161	7111
06:18	MA37610-CCB19	2683	177480	32425	7767
06:24	MP89141-MB1	2695	178160	32834	7814

## INTERNAL STANDARD SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

Date Analyzed: 09/22/15

Methods: EPA 200.7, SW846 6010C

Analyst: BS

Run ID: MA37610

Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:30	MP89141-MB2	2689	178710	32745	7790
06:36	MP89141-B1	2625	171580	32989	7270
06:42	MP89141-B2	2635	172790	32872	7309
06:48	MP89141-S1	2537	165310	32792	6867
06:54	MP89141-S2	2539	164950	32608	6886
07:00	JC4099-1	2571	169240	32799	7059
07:06	MP89141-SD1	2658	174870	32988	7514
07:12	ZZZZZ	2021	131620	30080	5067 !
07:18	MA37610-CCV19	2608	167720	32440	7067
07:24	MA37610-CCB20	2689	176310	32596	7713
07:30	MA37610-CRI4	2650	175400	32393	7576
07:36	MA37610-CRID4	2685	177330	32939	7735
07:42	MA37610-CRIA4	2667	176380	33015	7683
07:48	MA37610-CCV20	2597	168260	32284	7068
07:54	MA37610-CCB21	2682	177120	32611	7755

R = Reference for ISTD limits. ! = Outside limits.

## LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	70-130 %
Istd#2	Yttrium (3600)	70-130 %
Istd#3	Yttrium (3710)	70-130 %
Istd#4	Indium	70-130 %

(a) No samples reported for the elements associated with this internal standard.

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Metal	Sample ID:	Time:	10:59		11:23		12:16		13:17		
		RL	IDL	ICB1 raw	final	CCB1 raw	final	CCB2 raw	final	CCB3 raw	final
Aluminum		200	7.3	anr							
Antimony		6.0	1.3	anr							
Arsenic		3.0	.69	anr							
Barium		200	.26	anr							
Beryllium		1.0	.11	anr							
Bismuth		20	1.4								
Boron		100	.86								
Cadmium		3.0	.22	anr							
Calcium		5000	5	anr							
Chromium		10	.47	anr							
Cobalt		50	.33	0.20	<50	0.10	<50	0.10	<50	0.10	<50
Copper		10	.84	anr							
Iron		100	2	anr							
Lead		3.0	1.1	0.30	<3.0	0.50	<3.0	0.80	<3.0	0.40	<3.0
Lithium		20	.65								
Magnesium		5000	11	anr							
Manganese		15	.17	anr							
Molybdenum		20	.44	anr							
Nickel		10	.96	-0.20	<10	-0.20	<10	0.0	<10	0.0	<10
Palladium		50	1.3								
Potassium		10000	31	anr							
Selenium		10	1.4	anr							
Silicon		200	4								
Silver		10	.4	anr							
Sodium		10000	9	anr							
Sulfur		50	4.4								
Strontium		10	.13								
Thallium		2.0	1.6	anr							
Tin		10	.68								
Titanium		10	.41								
Tungsten		50	.91								
Vanadium		50	.36	0.40	<50	0.40	<50	0.30	<50	0.80	<50
Zinc		20	.54	0.0	<20	0.0	<20	0.10	<20	0.20	<20

**10.2.2  
10**

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Time:	10:59	11:23	12:16	13:17
Sample ID:	ICB1	CCB1	CCB2	CCB3
Metal	RL	IDL	raw	final

Zirconium    10    .32

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Metal	Time: Sample ID: RL	IDL	14:23 CCB4		15:28 CCB5		16:35 CCB6		17:41 CCB7	
			raw	final	raw	final	raw	final	raw	final
Aluminum	200	7.3	anr							
Antimony	6.0	1.3	anr							
Arsenic	3.0	.69	anr							
Barium	200	.26	anr							
Beryllium	1.0	.11	anr							
Bismuth	20	1.4								
Boron	100	.86								
Cadmium	3.0	.22	anr							
Calcium	5000	5	anr							
Chromium	10	.47	anr							
Cobalt	50	.33	0.20	<50	0.10	<50	0.20	<50	0.20	<50
Copper	10	.84	anr							
Iron	100	2	anr							
Lead	3.0	1.1	1.1	<3.0	0.10	<3.0	0.30	<3.0	0.70	<3.0
Lithium	20	.65								
Magnesium	5000	11	anr							
Manganese	15	.17	anr							
Molybdenum	20	.44	anr							
Nickel	10	.96	0.10	<10	-0.10	<10	0.10	<10	-0.10	<10
Palladium	50	1.3								
Potassium	10000	31	anr							
Selenium	10	1.4	anr							
Silicon	200	4								
Silver	10	.4	anr							
Sodium	10000	9	anr							
Sulfur	50	4.4								
Strontium	10	.13								
Thallium	2.0	1.6	anr							
Tin	10	.68								
Titanium	10	.41								
Tungsten	50	.91								
Vanadium	50	.36	0.40	<50	0.40	<50	0.60	<50	0.70	<50
Zinc	20	.54	0.10	<20	0.0	<20	0.20	<20	0.20	<20

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Time: Sample ID:	14:23 CCB4	15:28 CCB5	16:35 CCB6	17:41 CCB7						
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final

Zirconium      10      .32

(\*) Outside of QC limits  
(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Metal	Sample ID:	Time: RL	18:47 CCB8		19:29 CCB9	
			raw	final	raw	final
Aluminum		200	7.3	anr		
Antimony		6.0	1.3	anr		
Arsenic		3.0	.69	anr		
Barium		200	.26	anr		
Beryllium		1.0	.11	anr		
Bismuth		20	1.4			
Boron		100	.86			
Cadmium		3.0	.22	anr		
Calcium		5000	5	anr		
Chromium		10	.47	anr		
Cobalt		50	.33	0.10	<50	0.10
Copper		10	.84	anr		
Iron		100	2	anr		
Lead		3.0	1.1	0.0	<3.0	-0.50
Lithium		20	.65			
Magnesium		5000	11	anr		
Manganese		15	.17	anr		
Molybdenum		20	.44	anr		
Nickel		10	.96	0.10	<10	-0.30
Palladium		50	1.3			
Potassium		10000	31	anr		
Selenium		10	1.4	anr		
Silicon		200	4			
Silver		10	.4	anr		
Sodium		10000	9	anr		
Sulfur		50	4.4			
Strontium		10	.13			
Thallium		2.0	1.6	anr		
Tin		10	.68			
Titanium		10	.41			
Tungsten		50	.91			
Vanadium		50	.36	0.60	<50	0.60
Zinc		20	.54	0.10	<20	0.10
						<20

BLANK RESULTS SUMMARY  
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: result < RL      Run ID: MA37610      Units: ug/l

Time:	18:47	19:29				
Sample ID:	CCB8	CCB9				
Metal	RL	IDL	raw	final	raw	final

Zirconium      10      .32

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.2  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP  
QC Limits: 95 to 105 % Recovery

Date Analyzed: 09/22/15  
Run ID: MA37610

Methods: EPA 200.7, SW846 6010C  
Units: ug/l

Metal	Time: Sample ID: Metal	11:04 ICCV True	Results ICCV1	% Rec
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	2000	2030	101.5	
Copper	anr			
Iron	anr			
Lead	2000	2040	102.0	
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	2000	2010	100.5	
Palladium				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Sulfur				
Strontium				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	2000	2000	100.0	
Zinc	2000	2060	103.0	

CALIBRATION CHECK STANDARDS SUMMARY  
Initial Continuing Calibration Check

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 95 to 105 % Recovery      Run ID: MA37610      Units: ug/l

Time:	11:04
Sample ID:	ICCV
Metal	True

Results % Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.3  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 95 to 105 % Recovery      Run ID: MA37610      Units: ug/l

Metal	Time: Sample ID: True	10:45 ICV1 Results		CCV True	12:10 CCV1 Results		CCV True	13:11 CCV2 Results	
		% Rec			% Rec			% Rec	
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	2000	1970	98.5	2000	2040	102.0	2000	2040	102.0
Copper	anr								
Iron	anr								
Lead	2000	2010	100.5	2000	2060	103.0	2000	2070	103.5
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	2000	1990	99.5	2000	2010	100.5	2000	2000	100.0
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	1980	99.0	2000	1990	99.5	2000	1990	99.5
Zinc	2000	2020	101.0	2000	2080	104.0	2000	2080	104.0

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 95 to 105 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	10:45	12:10	13:11	
Sample ID:	ICV	CCV1	CCV2	
Metal	True	Results % Rec	True	Results % Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.4  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 95 to 105 % Recovery      Run ID: MA37610      Units: ug/l

Metal	Time: Sample ID: True	14:17 CCV Results		15:23 CCV Results		16:29 CCV Results		% Rec	
		CCV3	% Rec	CCV4	% Rec	CCV5	% Rec		
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth									
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	2000	2040	102.0	2000	2050	102.5	2000	2040	102.0
Copper	anr								
Iron	anr								
Lead	2000	2070	103.5	2000	2080	104.0	2000	2080	104.0
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	2000	2000	100.0	2000	2000	100.0	2000	1990	99.5
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	1980	99.0	2000	2000	100.0	2000	1990	99.5
Zinc	2000	2080	104.0	2000	2080	104.0	2000	2080	104.0

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 95 to 105 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	14:17	CCV	Results	% Rec	Time:	15:23	CCV	Results	% Rec	Time:	16:29	CCV	Results	% Rec	
Metal	True	CCV3	True	CCV4	True	CCV5	True	CCV	Results	% Rec	CCV	CCV5	True	Results	% Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.4  
**10**

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 95 to 105 % Recovery      Run ID: MA37610      Units: ug/l

Metal	Time:	17:35		18:41		19:24		Results	% Rec
	Sample ID:	CCV	CCV6	CCV	CCV7	CCV	CCV8		
Aluminum	True			True		True			
Antimony		anr							
Arsenic		anr							
Barium		anr							
Beryllium		anr							
Bismuth									
Boron									
Cadmium		anr							
Calcium		anr							
Chromium		anr							
Cobalt	2000	2060	103.0	2000	2050	102.5	2000	2060	103.0
Copper		anr							
Iron		anr							
Lead	2000	2090	104.5	2000	2090	104.5	2000	2100	105.0
Lithium									
Magnesium		anr							
Manganese		anr							
Molybdenum		anr							
Nickel	2000	2010	100.5	2000	2000	100.0	2000	2010	100.5
Palladium									
Potassium		anr							
Selenium		anr							
Silicon									
Silver		anr							
Sodium		anr							
Sulfur									
Strontium									
Thallium		anr							
Tin									
Titanium									
Tungsten									
Vanadium	2000	2000	100.0	2000	1990	99.5	2000	2000	100.0
Zinc	2000	2090	104.5	2000	2090	104.5	2000	2090	104.5

CALIBRATION CHECK STANDARDS SUMMARY  
Initial and Continuing Calibration Checks

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 95 to 105 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	17:35	CCV6	CCV	18:41	CCV7	CCV	19:24	CCV8		
Metal	Sample ID:	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.4  
**10**

## HIGH STANDARD CHECK SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP  
QC Limits: 95 to 105 % RecoveryDate Analyzed: 09/22/15  
Run ID: MA37610Methods: EPA 200.7, SW846 6010C  
Units: ug/l

Time:	11:58	HSTD	HSTD1	12:04	HSTD	HSTD2	
Sample ID:		True	Results	% Rec	True	Results	% Rec

Aluminum

Antimony anr

Arsenic anr

Barium anr

Beryllium anr

Bismuth

Boron

Cadmium anr

Calcium

Chromium anr

Cobalt 5000 5150 103.0

Copper anr

Iron

Lead 5000 5270 105.4

Lithium

Magnesium

Manganese anr

Molybdenum anr

Nickel 5000 5020 100.4

Palladium

Potassium

Selenium anr

Silicon

Silver anr

Sodium

Sulfur

Strontium

Thallium anr

Tin

Titanium

Tungsten

Vanadium 5000 5170 103.4

Zinc 5000 5360 107.2

10.2.5  
10

HIGH STANDARD CHECK SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 95 to 105 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	11:58		12:04	
Sample ID:	HSTD	HSTD1	HSTD	HSTD2
Metal	True	Results % Rec	True	Results % Rec

Zirconium

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.5  
10

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP  
QC Limits: 70 to 130 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Metal	Time:		11:27		11:33		11:39	
	Sample ID:	CRI	CRIA	CRID	CRIL	Results	% Rec	Results
Aluminum	200	500	100		anr			
Antimony	6.0	20	3.0		anr			
Arsenic	8.0	20	3.0		anr			
Barium	200		4.0		anr			
Beryllium	2.0		1.0		anr			
Bismuth	20							
Boron	100		10					
Cadmium	3.0		1.0		anr			
Calcium	5000	2000	1000		anr			
Chromium	10		2.0		anr			
Cobalt	50		3.0	49.6	99.2	3.1	103.3	
Copper	10		2.0		anr			
Iron	100	500			anr			
Lead	3.0	20	2.5	3.3	110.0			22.5
Lithium	20							112.5
Magnesium	5000	2000	100		anr			
Manganese	15		3.0		anr			
Molybdenum	20				anr			
Nickel	10		4.0	9.4	94.0	4.1	102.5	
Palladium	50							
Potassium	5000		2000		anr			
Selenium	10	20	5.0		anr			
Silicon	200							
Silver	5.0		2.0		anr			
Sodium	5000		1000		anr			
Sulfur	50							
Strontium	10							
Thallium	10		2.0		anr			
Tin	10							
Titanium	10							
Tungsten	50							
Vanadium	50		2.0	49.2	98.4	2.2	110.0	
Zinc	20		10	22.8	114.0	11.4	114.0	

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 70 to 130 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Time:	11:27			11:33			11:39					
Sample ID:	CRI	CRIA	CRID	CRII	Results	% Rec	CRIDL	Results	% Rec	CRIAL	Results	% Rec
Metal	True	True	True									
Zirconium	10	5.0										

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.6  
10

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP  
QC Limits: 70 to 130 % RecoveryDate Analyzed: 09/22/15  
Run ID: MA37610Methods: EPA 200.7, SW846 6010C  
Units: ug/l

Metal	Time:			18:53		18:59		19:05				
	Sample ID:	CRI	CRIA	CRID	CRI2	Results	% Rec	CRID2	Results	% Rec	CRIA2	% Rec
Aluminum	200	500	100		anr							
Antimony	6.0	20	3.0		anr							
Arsenic	8.0	20	3.0		anr							
Barium	200		4.0		anr							
Beryllium	2.0		1.0		anr							
Bismuth	20											
Boron	100		10									
Cadmium	3.0		1.0		anr							
Calcium	5000	2000	1000		anr							
Chromium	10		2.0		anr							
Cobalt	50		3.0	50.3		100.6		3.1		103.3		
Copper	10		2.0		anr							
Iron	100	500			anr							
Lead	3.0	20	2.5	3.3		110.0		3.2		128.0		23.5
Lithium	20											117.5
Magnesium	5000	2000	100		anr							
Manganese	15		3.0		anr							
Molybdenum	20				anr							
Nickel	10		4.0	9.9		99.0		3.9		97.5		
Palladium	50											
Potassium	5000		2000		anr							
Selenium	10	20	5.0		anr							
Silicon	200											
Silver	5.0		2.0		anr							
Sodium	5000		1000		anr							
Sulfur	50											
Strontium	10											
Thallium	10		2.0		anr							
Tin	10											
Titanium	10											
Tungsten	50											
Vanadium	50		2.0	49.9		99.8						
Zinc	20		10	23.2		116.0						

10.2.6  
**10**

## LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP

QC Limits: 70 to 130 % Recovery

Date Analyzed: 09/22/15

Run ID: MA37610

Methods: EPA 200.7, SW846 6010C

Units: ug/l

Metal	Time:			18:53		18:59		19:05			
	Sample ID:	CRI	CRIA	CRID	CRI2	Results	% Rec	CRID2	CRIA2	Results	% Rec
Zirconium		True	True	True		5.0					

Zirconium 10 5.0

(\*) Outside of QC limits  
(anr) Analyte not requested10.2.6  
10

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP      Date Analyzed: 09/22/15      Methods: EPA 200.7, SW846 6010C  
QC Limits: 80 to 120 % Recovery      Run ID: MA37610      Units: ug/l

Metal	Time:		11:45		11:52		19:11		19:17	
	Sample ID:	ICSA	ICSA	Results	% Rec	ICSA	Results	% Rec	ICSA	Results
Aluminum	500000	500000	490000	98.0		499000	99.8		495000	99.0
Antimony	1000		7.0			1110	111.0	7.0		1120
Arsenic	1000		0.60			1010	101.0	-1.8		1010
Barium	500		0.40			501	100.2	0.40		505
Beryllium	500		0.0			499	99.8	-0.10		492
Bismuth	500		33.1			530	106.0	32.5		532
Boron			-1.3			-1.5		-0.70		0.20
Cadmium	1000		1.4			1060	106.0	1.8		1080
Calcium	400000	400000	375000	93.8		378000	94.5		373000	93.3
Chromium	500		-3.6			484	96.8	-3.9		487
Cobalt	500		-0.80			492	98.4	-0.30		497
Copper	500		-2.2			498	99.6	-2.8		504
Iron	200000	200000	181000	90.5		183000	91.5		178000	89.0
Lead	1000		1.0			978	97.8	3.1		994
Lithium	500		-0.50			559	111.8	0.30		555
Magnesium	500000	500000	513000	102.6		510000	102.0		507000	101.4
Manganese	500		4.1			508	101.6	3.7		520
Molybdenum	500		-0.70			507	101.4	-0.50		515
Nickel	1000		0.80			965	96.5	0.90		967
Palladium	500		-34			512	102.4	-34		525
Potassium			157			175		204		209
Selenium	1000		6.4			1050	105.0	7.5		1040
Silicon			-21			-28		-19		-30
Silver	1000		5.2			1040	104.0	3.1		1060
Sodium			81.5			77.8		84.8		78.8
Sulfur	500		-3.8			511	102.2	-1.4		519
Strontium			9.1			9.3		9.3		9.5
Thallium	1000		-0.80			966	96.6	-0.40		974
Tin			2.3			3.4		2.2		2.7
Titanium			0.60			0.30		0.60		0.40
Tungsten	500		8.6			527	105.4	8.5		537
Vanadium	500		-2.2			482	96.4	-2.0		485
Zinc	1000		5.2			987	98.7	5.5		995

INTERFERING ELEMENT CHECK STANDARDS SUMMARY  
Part 1 - ICSA and ICSAB Standards

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

File ID: SA092215M1.ICP  
QC Limits: 80 to 120 % Recovery

Date Analyzed: 09/22/15  
Run ID: MA37610

Methods: EPA 200.7, SW846 6010C  
Units: ug/l

Metal	Time: Sample ID: Metal	ICSA True	ICSA True	11:45 ICSA1 Results	% Rec	11:52 ICSA1 Results	% Rec	19:11 ICSA2 Results	% Rec	19:17 ICSA2 Results	% Rec
Zirconium		500	12.3			535	107.0	11.5		547	109.4

(\*) Outside of QC limits  
(anr) Analyte not requested

10.2.7  
**10**

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

09/18/15

Metal	RL	IDL	MDL	MB raw	final
Aluminum	49	.72	3.2		
Antimony	2.0	.13	.31		
Arsenic	2.0	.068	.13		
Barium	20	.02	.053		
Beryllium	0.20	.0098	.04		
Bismuth	2.0	.14	.37		
Boron	9.8	.085	.42		
Cadmium	0.49	.022	.05		
Calcium	490	.44	2.7		
Chromium	0.98	.047	.097		
Cobalt	4.9	.033	.039	0.0098	<4.9
Copper	2.5	.083	.14		
Iron	49	.17	3.2		
Lead	2.0	.11	.23	-0.029	<2.0
Lithium	2.0	.064	.32		
Magnesium	490	1.1	8.8		
Manganese	1.5	.0098	.035		
Molybdenum	2.0	.044	.15		
Nickel	3.9	.049	.094	0.020	<3.9
Palladium	4.9	.13	.36		
Potassium	980	2.9	7.3		
Selenium	2.0	.14	.25		
Silicon	20	.19	1.6		
Silver	0.50	.04	.18		
Sodium	980	.89	1.5		
Strontium	0.98	.0098	.033		
Sulfur	4.9	.4	.68		
Thallium	0.98	.16	.19		
Tin	4.9	.067	1.1		
Titanium	0.98	.041	.2		
Tungsten	4.9	.09	.42		
Vanadium	4.9	.036	.074	0.029	<4.9
Zinc	4.9	.029	.75	1.2	<4.9

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: JC4006  
Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

09/18/15

Metal	RL	IDL	MDL	MB raw	final
Zirconium	2.0	.029	.1		

Associated samples MP89095: JC4006-1, JC4006-2, JC4006-3, JC4006-4

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

10.3.1  
**10**

## MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PAQC Batch ID: MP89095  
Matrix Type: SOLIDMethods: SW846 6010C  
Units: mg/kg

Prep Date: 09/21/15

Metal	JC3239-2 Original MS	Spikelot MPSPK1	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	32.5	233	216	92.7
Copper	anr			
Iron	anr			
Lead	136	404	216	124.0
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	21.0	216	216	90.2
Palladium				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Tungsten				
Vanadium	36.0	235	216	92.1
Zinc	374	530	216	72.2N(a)
Zirconium				75-125

10.3.2  
**10**

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 09/21/15

Metal	JC3239-2 Original MS	Spikelot MPSPK1	QC % Rec	QC Limits
-------	-------------------------	--------------------	-------------	--------------

Associated samples MP89095: JC4006-1, JC4006-2, JC4006-3, JC4006-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

10.3.2

10

## MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLIDMethods: SW846 6010C  
Units: mg/kg

Prep Date:

09/21/15

Metal	JC3239-2 Original	MSD	Spikelot MPSPK1	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Bismuth						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt	32.5	209	216	81.6	10.9	20
Copper	anr					
Iron	anr					
Lead	136	326	216	87.9	21.4 (a)	20
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	21.0	209	216	87.0	3.3	20
Palladium						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Strontium						
Sulfur						
Thallium	anr					
Tin						
Tungsten						
Vanadium	36.0	231	216	90.2	1.7	20
Zinc	374	320	216	-25.0N(b	49.4 (a)	20
Zirconium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

09/21/15

Metal	JC3239-2 Original MSD	Spikelot MPSPK1	MSD % Rec	RPD	QC Limit
-------	--------------------------	--------------------	--------------	-----	-------------

Associated samples MP89095: JC4006-1, JC4006-2, JC4006-3, JC4006-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) High rpd due to possible sample nonhomogeneity.

(b) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

10.3.2  
**10**

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JC4006  
 Account: SECORPAE - Stantec Consulting Services Inc.  
 Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 09/18/15

Metal	BSP Result	Spikelot MPSPK1	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic				
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	196	208	94.1	80-120
Copper	anr			
Iron	anr			
Lead	200	208	96.0	80-120
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	198	208	95.0	80-120
Palladium				
Potassium	anr			
Selenium	anr			
Silicon				
Silver				
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	193	208	92.6	80-120
Zinc	203	208	97.4	80-120

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

09/18/15

Metal	BSP Result	Spikelot MPSPK1	QC % Rec	QC Limits
-------	---------------	--------------------	-------------	--------------

Zirconium

Associated samples MP89095: JC4006-1, JC4006-2, JC4006-3, JC4006-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

10.3.3

10

## SERIAL DILUTION RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.  
Project: Sunoco - Marcus Hook Facility, PAQC Batch ID: MP89095  
Matrix Type: SOLIDMethods: SW846 6010C  
Units: ug/l

Prep Date: 09/21/15

Metal	JC3239-2 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Bismuth				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt	292	298	2.1	0-10
Copper	anr			
Iron	anr			
Lead	1220	1270	3.8	0-10
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	188	191	1.3	0-10
Palladium				
Potassium	anr			
Selenium	anr			
Silicon				
Silver	anr			
Sodium	anr			
Strontium				
Sulfur				
Thallium	anr			
Tin				
Titanium				
Tungsten				
Vanadium	324	341	5.3	0-10
Zinc	3360	3610	7.5	0-10

SERIAL DILUTION RESULTS SUMMARY

Login Number: JC4006

Account: SECORPAE - Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

QC Batch ID: MP89095  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

09/21/15

Metal	JC3239-2	Original	SDL 1:5	%DIF	QC	Limits
-------	----------	----------	---------	------	----	--------

Zirconium

Associated samples MP89095: JC4006-1, JC4006-2, JC4006-3, JC4006-4

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

10.3.4

10



## General Chemistry

---

### QC Data Summaries

---

Includes the following where applicable:

- Percent Solids Raw Data Summary

## Percent Solids Raw Data Summary

Page 1 of 1

Job Number: JC4006

Account: SECORPAE Stantec Consulting Services Inc.

Project: Sunoco - Marcus Hook Facility, PA

---

Sample: JC4006-1      Analyzed: 18-SEP-15 by KP      Method: SM2540 G-97  
ClientID: MHIC-388-8(5.0)

Wet Weight (Total)	27.15	g
Tare Weight	20.11	g
Dry Weight (Total)	25.68	g
Solids, Percent	79.1	%

---

Sample: JC4006-2      Analyzed: 18-SEP-15 by KP      Method: SM2540 G-97  
ClientID: MHIC-388-9(5.0)

Wet Weight (Total)	26.73	g
Tare Weight	18.26	g
Dry Weight (Total)	25.19	g
Solids, Percent	81.8	%

---

Sample: JC4006-3      Analyzed: 18-SEP-15 by KP      Method: SM2540 G-97  
ClientID: MHIC-388-10(5.0)

Wet Weight (Total)	30.42	g
Tare Weight	22.7	g
Dry Weight (Total)	28.89	g
Solids, Percent	80.2	%

---

Sample: JC4006-4      Analyzed: 18-SEP-15 by KP      Method: SM2540 G-97  
ClientID: MHIC-388-11(5.0)

Wet Weight (Total)	36.26	g
Tare Weight	27.17	g
Dry Weight (Total)	34.67	g
Solids, Percent	82.5	%

---



## Misc. Forms

---

### Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

---

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



# CHAIN OF CUSTODY

Page 1 of 1

<b>Client / Reporting Information</b> Company Name: <b>Accutest Laboratories</b> Project Name: <b>Sunoco - Marcus Hook Facility, PA</b> Street Address: <b>2235 Route 130</b> City: <b>Dayton</b> State: <b>NJ</b> Zip: <b>08810</b> Project Contact: <b>E-mail</b> <b>mariem@accutest.com</b> Phone # <b>732-329-0200</b> Fax # <b></b> Sampler(s) Name(s) <b>DH</b> Phone: <b>Project Manager</b> Attention: <b></b>												
<b>Project Information</b> Billing Information ( if different from Report to) Company Name: <b></b>												
<b>Requested Analysis ( see TEST CODE sheet)</b>												
<b>Matrix Codes</b> DW - Drinking Water GW - Ground Water WR - Water SW - Surface Water SO - Soil SL - Sludge SED-Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB-Rinse Blank TB-Trip Blank												
<b>Collection</b>												
<small>Accutest Sample #</small>	<small>Field ID / Point of Collection</small>	<small>MEOH/DI Vial #</small>	<small>Date</small>	<small>Time</small>	<small>Sampled by</small>	<small>Matrix</small>	<small># of bottles</small>	<b>Number of preserved bottles</b>				
								<small>1</small> <small>2</small> <small>3</small> <small>4</small> <small>5</small> <small>6</small> <small>7</small> <small>8</small> <small>9</small> <small>10</small> <small>11</small> <small>12</small> <small>13</small> <small>14</small> <small>15</small> <small>16</small> <small>17</small> <small>18</small> <small>19</small> <small>20</small> <small>21</small> <small>22</small> <small>23</small> <small>24</small> <small>25</small> <small>26</small> <small>27</small> <small>28</small> <small>29</small> <small>30</small> <small>31</small> <small>32</small> <small>33</small> <small>34</small> <small>35</small> <small>36</small> <small>37</small> <small>38</small> <small>39</small> <small>40</small> <small>41</small> <small>42</small> <small>43</small> <small>44</small> <small>45</small> <small>46</small> <small>47</small> <small>48</small> <small>49</small> <small>50</small> <small>51</small> <small>52</small> <small>53</small> <small>54</small> <small>55</small> <small>56</small> <small>57</small> <small>58</small> <small>59</small> <small>60</small> <small>61</small> <small>62</small> <small>63</small> <small>64</small> <small>65</small> <small>66</small> <small>67</small> <small>68</small> <small>69</small> <small>70</small> <small>71</small> <small>72</small> <small>73</small> <small>74</small> <small>75</small> <small>76</small> <small>77</small> <small>78</small> <small>79</small> <small>80</small> <small>81</small> <small>82</small> <small>83</small> <small>84</small> <small>85</small> <small>86</small> <small>87</small> <small>88</small> <small>89</small> <small>90</small> <small>91</small> <small>92</small> <small>93</small> <small>94</small> <small>95</small> <small>96</small> <small>97</small> <small>98</small> <small>99</small> <small>100</small>	<small>H2O</small> <small>HCl</small> <small>HNO3</small> <small>H2SO4</small> <small>NONE</small> <small>CH3COOH</small> <small>MEOH</small> <small>EDTA</small> <small>EDTA-Na2</small>			
<small>LAB USE ONLY</small>												
<small>sub</small> <small>sub</small> <small>sub</small> <small>sub</small>												
<small>Turnaround Time ( Business days)</small>												
<b>Data Deliverable Information</b>												
<small>Comments / Special Instructions</small>												
<small>Approved By (Accutest P/M) / Date:</small> <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input checked="" type="checkbox"/> other <b>Due 9/30/2015</b> <small>Emergency &amp; Rush T/A data available via LabLink</small>						<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULL1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NYASPC Category A <input type="checkbox"/> NYASPC Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format _____ <input checked="" type="checkbox"/> Other REDT2 <small>Commercial "A" = Results Only            Commercial "B" = Results + QC Summary            NJ Reduced = Results + QC Summary + Partial Raw data</small>						
<small>Sample Custody must be documented below each time samples change possession, including courier delivery.</small>												
<small>Relinquished by Sampler:</small> 1 <i>FED X</i> <small>Date Time:</small> <i>9/17/15 1700</i> <small>Received By:</small> <i>FED X</i>			<small>Relinquished By:</small> 2 <small>Date Time:</small> <i>9/18/15 92</i> <small>Received By:</small> <i>2021 M</i>			<small>Relinquished By:</small> 3 <small>Date Time:</small> <i>9/18/15 92</i> <small>Received By:</small> <i>2021 M</i>			<small>Relinquished By:</small> 4 <small>Date Time:</small> <i>9/18/15 92</i> <small>Received By:</small> <i>2021 M</i>			
<small>Relinquished by Sampler:</small> 5 <small>Date Time:</small> <i>9/18/15 92</i> <small>Received By:</small> <i>5</i>			<small>Custody Seal #:</small> <i>934</i> <input type="checkbox"/> Intact <input type="checkbox"/> Not intact <small>Preserved where applicable</small>			<small>On Ice</small> <i>0,3°C</i> <small>Cooler Temp.</small>						

*NE*



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JC4006

Client: ACNJ

Project: MARCUS

Date / Time Received: 9/18/2015 9:30:00 AM

Delivery Method:

Airbill #'s:

Cooler Temps (Initial/Adjusted): #1: (0.3/0.3)

**Cooler Security**

	<u>Y</u> or <u>N</u>		<u>Y</u> or <u>N</u>		
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Cooler Temperature**

	<u>Y</u> or <u>N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Thermometer ID:	G1;	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	1	

**Quality Control Preservation**

	<u>Y</u> or <u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>

**Sample Integrity - Documentation**

	<u>Y</u> or <u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>

**Sample Integrity - Condition**

	<u>Y</u> or <u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>
3. Condition of sample:	Intact

**Sample Integrity - Instructions**

	<u>Y</u> or <u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories  
V:(508) 481-6200495 Technology Center West, Bldg One  
F: (508) 481-7753Marlborough, MA 01752  
[www.accutest.com](http://www.accutest.com)12.1  
12**JC4006: Chain of Custody****Page 2 of 2**

## Internal Sample Tracking Chronicle

Accutest New Jersey

Job No: JC4006

SECORPAE: Sunoco - Marcus Hook Facility, PA  
Project No: MHIC-AST-388 Closure/213402603

Sample Number	Method	Analyzed By	Prepped By	Test Codes
JC4006-1	Collected: 16-SEP-15 13:05 By: DH MHIC-388-8(5.0)		Received: 16-SEP-15 By: SAP	
JC4006-1	SW846 8011	25-SEP-15 02:12	NK	22-SEP-15 ES V8011EDB
JC4006-2	Collected: 16-SEP-15 13:20 By: DH MHIC-388-9(5.0)		Received: 16-SEP-15 By: SAP	
JC4006-2	SW846 8011	25-SEP-15 02:40	NK	22-SEP-15 ES V8011EDB
JC4006-3	Collected: 16-SEP-15 13:56 By: DH MHIC-388-10(5.0)		Received: 16-SEP-15 By: SAP	
JC4006-3	SW846 8011	25-SEP-15 03:08	NK	22-SEP-15 ES V8011EDB
JC4006-4	Collected: 16-SEP-15 14:00 By: DH MHIC-388-11(5.0)		Received: 16-SEP-15 By: SAP	
JC4006-4	SW846 8011	25-SEP-15 03:36	NK	22-SEP-15 ES V8011EDB

## Accutest Internal Chain of Custody

Page 1 of 1

Job Number: JC4006  
Account: ALNJ Accutest New Jersey  
Project: SECORPAE: Sunoco - Marcus Hook Facility, PA  
Received: 09/16/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC4006-1.1	Walk In Ref #5	Forrest Thompson	09/21/15 14:42	Retrieve from Storage
JC4006-1.1	Forrest Thompson	Walk In Ref #5	09/21/15 21:27	Return to Storage
JC4006-1.1	Walk In Ref #5	Aysia Wood	09/22/15 08:56	Retrieve from Storage
JC4006-1.1	Aysia Wood	Walk In Ref #5	09/22/15 14:41	Return to Storage
JC4006-2.1	Walk In Ref #5	Forrest Thompson	09/21/15 14:42	Retrieve from Storage
JC4006-2.1	Forrest Thompson	Walk In Ref #5	09/21/15 21:27	Return to Storage
JC4006-2.1	Walk In Ref #5	Aysia Wood	09/22/15 08:56	Retrieve from Storage
JC4006-2.1	Aysia Wood	Walk In Ref #5	09/22/15 14:41	Return to Storage
JC4006-3.1	Walk In Ref #5	Forrest Thompson	09/21/15 14:42	Retrieve from Storage
JC4006-3.1	Forrest Thompson	Walk In Ref #5	09/21/15 21:27	Return to Storage
JC4006-3.1	Walk In Ref #5	Aysia Wood	09/22/15 08:56	Retrieve from Storage
JC4006-3.1	Aysia Wood	Walk In Ref #5	09/22/15 14:41	Return to Storage
JC4006-4.1	Walk In Ref #5	Forrest Thompson	09/21/15 14:42	Retrieve from Storage
JC4006-4.1	Forrest Thompson	Walk In Ref #5	09/21/15 21:27	Return to Storage
JC4006-4.1	Walk In Ref #5	Aysia Wood	09/22/15 08:56	Retrieve from Storage
JC4006-4.1	Aysia Wood	Walk In Ref #5	09/22/15 14:41	Return to Storage



## GC Volatiles

---

### QC Data Summaries

(Accutest Labs of New England, Inc.)

---

**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

**Method Blank Summary**

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP44714-MB	BB64711.D	1	09/24/15	NK	09/22/15	OP44714	GBB3489

The QC reported here applies to the following samples:

Method: SW846 8011

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	2.5	0.41	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	104%
460-00-4	Bromofluorobenzene (S)	105%      70-170%

## Blank Spike Summary

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP44714-BS	BB64712.D	1	09/24/15	NK	09/22/15	OP44714	GBB3489

The QC reported here applies to the following samples:

Method: SW846 8011

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
106-93-4	1,2-Dibromoethane	32.3	30.5	93	59-133

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	95%	70-170%
460-00-4	Bromofluorobenzene (S)	95%	70-170%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP44714-MS	BB64732.D	1	09/24/15	NK	09/22/15	OP44714	GBB3489
OP44714-MSD	BB64733.D	1	09/25/15	NK	09/22/15	OP44714	GBB3489
MC41500-4	BB64736.D	1	09/25/15	NK	09/22/15	OP44714	GBB3489

The QC reported here applies to the following samples:

Method: SW846 8011

JC4006-1, JC4006-2, JC4006-3, JC4006-4

CAS No.	Compound	MC41500-4		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	ug/kg	%		
106-93-4	1,2-Dibromoethane	ND		34.2	38.7	113	34.3	40.8	119	5	74-147/30
Surrogate Recoveries											
460-00-4	Bromofluorobenzene (S)	131%		151%	131%	70-170%					
460-00-4	Bromofluorobenzene (S)	120%		127%	116%	70-170%					

\* = Outside of Control Limits.

# Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Method: SW846 8011

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
JC4006-1	BB64737.D	141	112
JC4006-2	BB64738.D	147	114
JC4006-3	BB64739.D	137	128
JC4006-4	BB64740.D	152	120
OP44714-BS	BB64712.D	95	95
OP44714-MB	BB64711.D	104	105
OP44714-MS	BB64732.D	131	120
OP44714-MSD	BB64733.D	151	127

Surrogate  
Compounds

Recovery  
Limits

S1 = Bromofluorobenzene (S)

70-170%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

13.4.1

13

# GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Check Std:	GBB3489-ICC3489	Injection Date:	09/24/15
Lab File ID:	BB64706.D	Injection Time:	11:44
Instrument ID:	GCBB	Method:	SW846 8011

S1 <sup>a</sup>  
RT

S1 <sup>b</sup>  
RT

Check Std	6.77	6.25
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP44699-MB	BB64709.D	09/24/15	13:07	6.78	6.24
OP44699-BS	BB64710.D	09/24/15	13:35	6.77	6.25
OP44714-MB	BB64711.D	09/24/15	14:03	6.78	6.24
OP44714-BS	BB64712.D	09/24/15	14:30	6.78	6.25
OP44715-MB	BB64713.D	09/24/15	14:58	6.78	6.24
OP44715-BS	BB64714.D	09/24/15	15:26	6.78	6.24
ZZZZZZ	BB64715.D	09/24/15	15:54	6.79	6.24
ZZZZZZ	BB64716.D	09/24/15	16:22	6.78	6.24
ZZZZZZ	BB64717.D	09/24/15	16:50	6.77	6.25
ZZZZZZ	BB64718.D	09/24/15	17:18	6.77	6.24

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

13.5.1  
**13**

# GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: JC4006

Account: ALNJ Accutest New Jersey

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

Check Std:	GBB3489-CC3489	Injection Date:	09/24/15
Lab File ID:	BB64730.D	Injection Time:	22:56
Instrument ID:	GCBB	Method:	SW846 8011

S1 <sup>a</sup>  
RT

S1 <sup>b</sup>  
RT

Check Std	6.77	6.23
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BB64731.D	09/24/15	23:24	6.76	6.24
OP44714-MS	BB64732.D	09/24/15	23:52	6.77	6.24
OP44714-MSD	BB64733.D	09/25/15	00:20	6.77	6.24
ZZZZZZ	BB64734.D	09/25/15	00:48	6.77	6.24
ZZZZZZ	BB64735.D	09/25/15	01:17	6.78	6.24
MC41500-4	BB64736.D	09/25/15	01:45	6.78	6.24
JC4006-1	BB64737.D	09/25/15	02:12	6.78	6.24
JC4006-2	BB64738.D	09/25/15	02:40	6.77	6.24
JC4006-3	BB64739.D	09/25/15	03:08	6.77	6.24
JC4006-4	BB64740.D	09/25/15	03:36	6.78	6.24

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

**Initial Calibration Summary**

Job Number: JC4006

Sample: GBB3489-ICC3489

Account: ALNJ Accutest New Jersey

Lab FileID: BB64706.D

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

## Response Factor Report GCBB

Method : C:\msdchem\1\METHODS\EDS150924.M (ChemStation Integrator)  
 Title : v8011edb soil  
 Last Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration

## Calibration Files

1	=BB64707.d	2	=BB64706.d	3	=BB64705.d	4	=BB64704.d
5	=BB64703.d	6	=BB64702.d				

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	1,2-Dibromoethane	8.380	7.706	9.626	8.172	8.059	9.569	8.585	E5 9.48
2) s	4-Bromofluorobenzen	5.027	4.810	5.732	5.813	5.150	8.034	5.761	E4 20.52
	----- Quadratic regression -----							Coefficient =	0.9950
	Response Ratio	= 115845.04304 + 50927.75271 *A + -8.57754 *A^2							
3)	1,2-Dibromo-3-chlor	1.645	1.275	1.460	1.297	1.206	1.456	1.390	E6 11.59
	----- Quadratic regression -----							Coefficient =	0.9970
	Response Ratio	= 240697.22575 + 1183910.74817 *A + 8933.51663 *A^2							

## Signal #2

1)	1,2-Dibromoethane	6.412	6.731	5.566	5.461	4.886	6.028	5.847	E6 11.56
	----- Quadratic regression -----							Coefficient =	0.9960
	Response Ratio	= -1243614.48047 + 6127298.23382 *A + 7337.36229 *A^2							
2) s	4-Bromofluorobenzen	4.186	4.993	4.188	4.192	3.948	4.214	4.287	E5 8.40
	----- Quadratic regression -----							Coefficient =	0.9935
	Response Ratio	= -664086.08912 + 489425.48493 *A + -295.95228 *A^2							
3)	1,2-Dibromo-3-chlor	1.023	1.123	1.098	1.124	1.062	1.245	1.112	E7 6.79

(#= Out of Range)

EDS150924.M

Mon Sep 28 08:26:39 2015

13.6.1

13

**Initial Calibration Verification**

Job Number: JC4006

Sample: GBB3489-ICV3489

Account: ALNJ Accutest New Jersey

Lab FileID: BB64708.D

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BB...24\BB64708.d\ECD1B.CH Vial: 82  
 Signal #2 : C:\msdchem\1\DATA\BB150924\BB64708.d\ECD2A.CH  
 Acq On : 24-Sep-15, 12:39:39 Operator: nickkk  
 Sample : icv3489-20,edb soil Inst : GCBB  
 Misc : op44699,gbb3489,30,,,50,,s Multiplr: 1.00  
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS150924.M (ChemStation Integrator)  
 Title : v801ledb soil  
 Last Update : Mon Sep 28 08:25:34 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1	1,2-Dibromoethane	858.536	847.321 E3	1.3	110	0.00	3.13-	3.19
----- True Calc. % Drift -----								
2 s	4-Bromofluorobenzene	100.000	102.259	-2.3	109	0.00	6.21-	6.27
3	1,2-Dibromo-3-chloropr	20.000	21.617	-8.1	118	0.00	10.24-	10.30
***** Signal #2 *****								
1	1,2-Dibromoethane	20.000	21.821	-9.1	101	0.01	3.93-	3.99
2 s	4-Bromofluorobenzene	100.000	106.980	-7.0	97	0.00	6.75-	6.81
----- AvgRF CCRF % Dev -----								
3	1,2-Dibromo-3-chloropr	11.124	11.044 E6	0.7	98	0.00	11.29-	11.35

(#) = Out of Range SPCC's out = 0 CCC's out = 0  
 BB64706.d EDS150924.M Mon Sep 28 08:26:30 2015

**Continuing Calibration Summary**

Job Number: JC4006

Sample: GBB3489-CC3489

Account: ALNJ Accutest New Jersey

Lab FileID: BB64719.D

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BB...24\BB64719.d\ECD1B.CH Vial: 100  
 Signal #2 : C:\msdchem\1\DATA\BB150924\BB64719.d\ECD2A.CH  
 Acq On : 24-Sep-15, 17:46:20 Operator: nickkk  
 Sample : cc3489-20,edb soil Inst : GCBB  
 Misc : op44699,gbb3489,30,,,50,,s Multiplr: 1.00  
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS150924.M (ChemStation Integrator)  
 Title : v801ledb soil  
 Last Update : Mon Sep 28 08:25:34 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1	1,2-Dibromoethane	858.536	772.234 E3	10.1	100	0.00	3.14-	3.20
----- True Calc. % Drift -----								
2 s	4-Bromofluorobenzene	100.000	85.601	14.4	92	0.00	6.22-	6.28
3	1,2-Dibromo-3-chloropr	20.000	18.510	7.4	99	0.00	10.24-	10.30
***** Signal #2 *****								
1	1,2-Dibromoethane	20.000	22.114	-10.6	102	0.00	3.91-	3.97
2 s	4-Bromofluorobenzene	100.000	121.104	-21.1#	109	0.00	6.74-	6.80
----- AvgRF CCRF % Dev -----								
3	1,2-Dibromo-3-chloropr	11.124	13.565 E6	-21.9#	121#	0.00	11.29-	11.35

(#) = Out of Range SPCC's out = 0 CCC's out = 0  
 BB64706.d EDS150924.M Mon Sep 28 08:34:43 2015

**Continuing Calibration Summary**

Job Number: JC4006

Sample: GBB3489-CC3489

Account: ALNJ Accutest New Jersey

Lab FileID: BB64730.D

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BB...24\BB64730.d\ECD1B.CH Vial: 100  
 Signal #2 : C:\msdchem\1\DATA\BB150924\BB64730.d\ECD2A.CH  
 Acq On : 24-Sep-15, 22:56:10 Operator: nickkk  
 Sample : cc3489-20,edb soil Inst : GCBB  
 Misc : op44699,gbb3489,30,,,50,,s Multiplr: 1.00  
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS150924.M (ChemStation Integrator)  
 Title : v8011edb soil  
 Last Update : Mon Sep 28 08:25:34 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1	1,2-Dibromoethane	858.536	780.163 E3	9.1	101	-0.02	3.12-	3.18
----- True Calc. % Drift -----								
2 s	4-Bromofluorobenzene	100.000	89.078	10.9	95	-0.01	6.20-	6.26
3	1,2-Dibromo-3-chloropr	20.000	21.241	-6.2	115	0.00	10.24-	10.30
***** Signal #2 *****								
1	1,2-Dibromoethane	20.000	22.420	-12.1	104	0.00	3.92-	3.98
2 s	4-Bromofluorobenzene	100.000	113.737	-13.7	102	0.00	6.74-	6.80
----- AvgRF CCRF % Dev -----								
3	1,2-Dibromo-3-chloropr	11.124	13.516 E6	-21.5#	120#	0.00	11.29-	11.35

(#) = Out of Range SPCC's out = 0 CCC's out = 0  
 BB64706.d EDS150924.M Mon Sep 28 08:33:52 2015

**Continuing Calibration Summary**

Job Number: JC4006

Sample: GBB3489-CC3489

Account: ALNJ Accutest New Jersey

Lab FileID: BB64741.D

Project: SECORPAE: Sunoco - Marcus Hook Facility, PA

## Evaluate Continuing Calibration Report

Signal #1 : C:\msdchem\1\DATA\BB...24\BB64741.d\ECD1B.CH Vial: 100  
 Signal #2 : C:\msdchem\1\DATA\BB150924\BB64741.d\ECD2A.CH  
 Acq On : 25-Sep-15, 04:04:22 Operator: nickkk  
 Sample : cc3489-20,edb soil Inst : GCBB  
 Misc : op44699,gbb3489,30,,,50,,s Multiplr: 1.00  
 IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\msdchem\1\METHODS\EDS150924.M (ChemStation Integrator)  
 Title : v8011edb soil  
 Last Update : Mon Sep 28 08:25:34 2015  
 Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 85% Max. R.T. Dev 0.50min  
 Max. RRF Dev : 15% Max. Rel. Area : 115%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT	Window
1	1,2-Dibromoethane	858.536	846.340 E3	1.4	110	-0.01	3.12-	3.18
----- True Calc. % Drift -----								
2 s	4-Bromofluorobenzene	100.000	93.882	6.1	100	0.00	6.21-	6.27
3	1,2-Dibromo-3-chloropr	20.000	24.106	-20.5#	133	0.00	10.24-	10.30
***** Signal #2 *****								
1	1,2-Dibromoethane	20.000	22.987	-14.9	107	0.00	3.93-	3.99
2 s	4-Bromofluorobenzene	100.000	124.359	-24.4#	111	0.00	6.74-	6.80
----- AvgRF CCRF % Dev -----								
3	1,2-Dibromo-3-chloropr	11.124	16.144 E6	-45.1#	144#	0.00	11.29-	11.35

(#) = Out of Range SPCC's out = 0 CCC's out = 0  
 BB64706.d EDS150924.M Mon Sep 28 08:33:22 2015



## GC Volatiles

---

### Raw Data

(Accutest Labs of New England, Inc.)

---

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64737.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 02:12:57  
 Operator : nickk  
 Sample : jc4006-1,op44714  
 Misc : op44714,gbb3489,30.13,,,50,,s  
 ALS Vial : 29 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:40:43 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds  
 2) s 4-Bromofl... 6.239 6.775 2929944 32453711 55.781 70.688 #  
 Spiked Amount 50.000 Range 60 - 140 Recovery = 111.56% 141.38%#

Target Compounds  
 1) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d  
 3) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

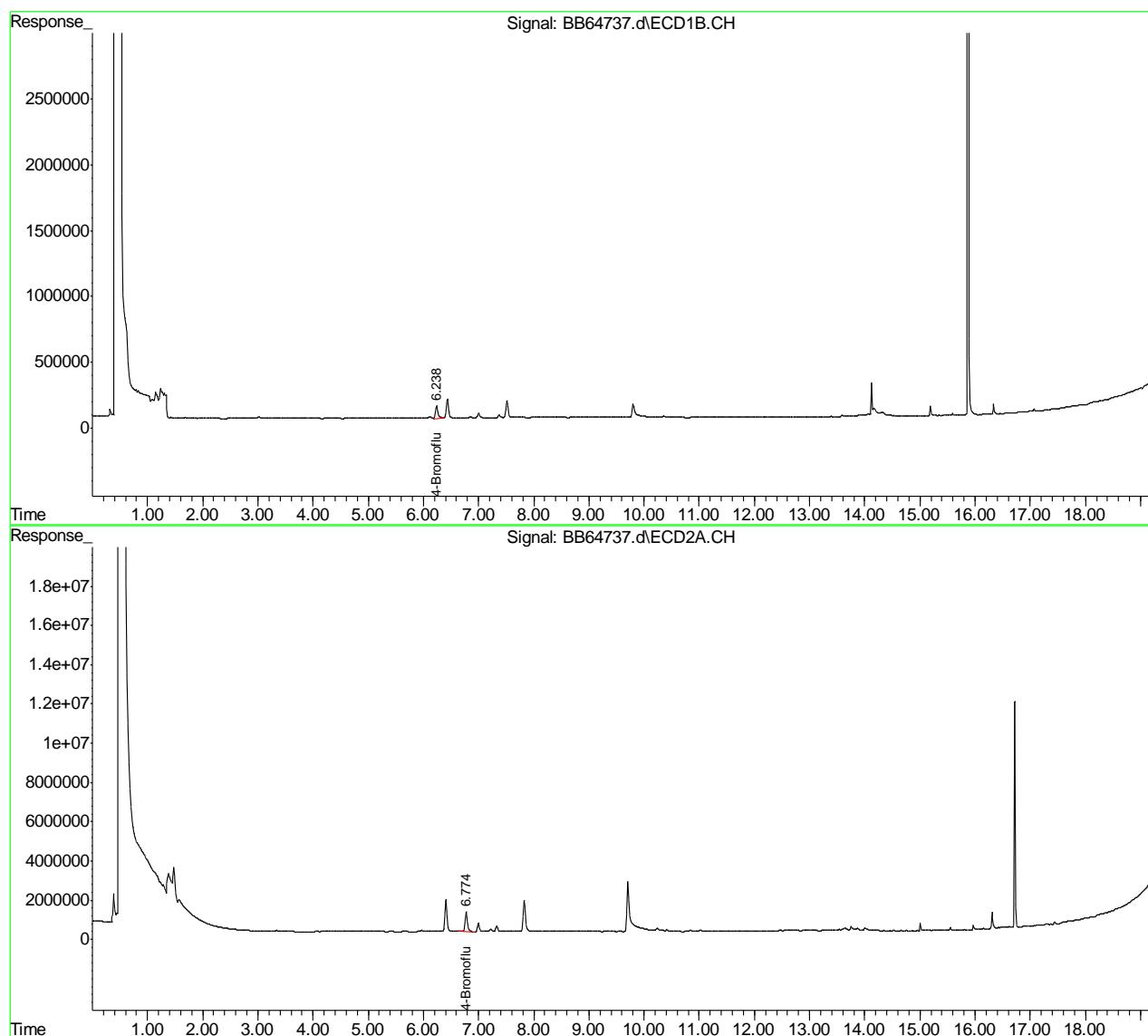
14.1.1  
14

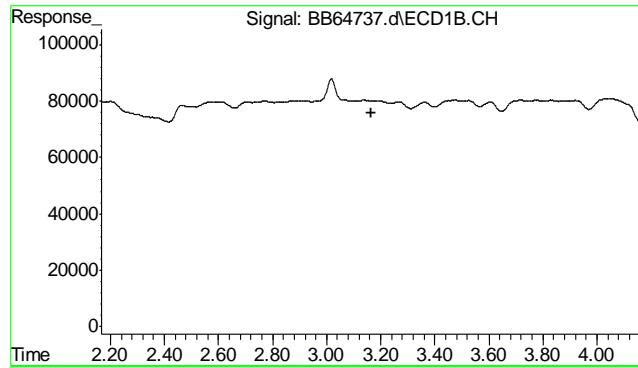
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64737.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 02:12:57  
 Operator : nickk  
 Sample : jc4006-1,op44714  
 Misc : op44714,gbb3489,30.13,,,50,,s  
 ALS Vial : 29 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

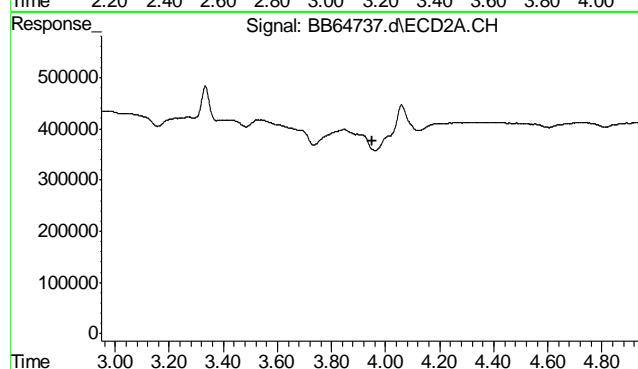
Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:40:43 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

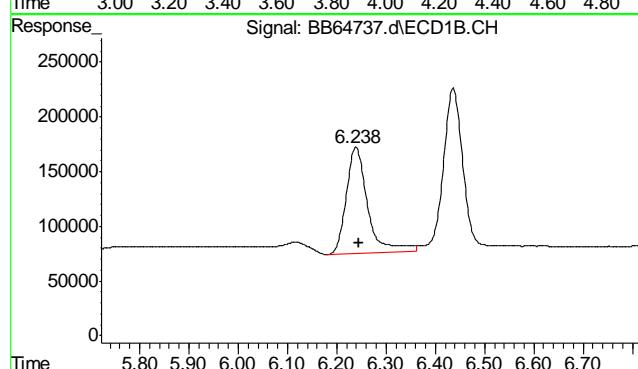




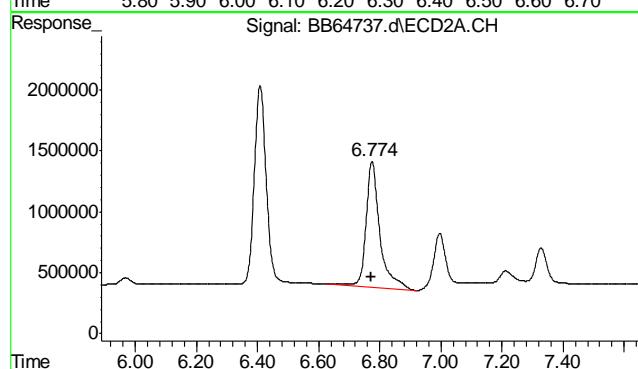
#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.166 min  
Response: 0  
Conc: N.D.



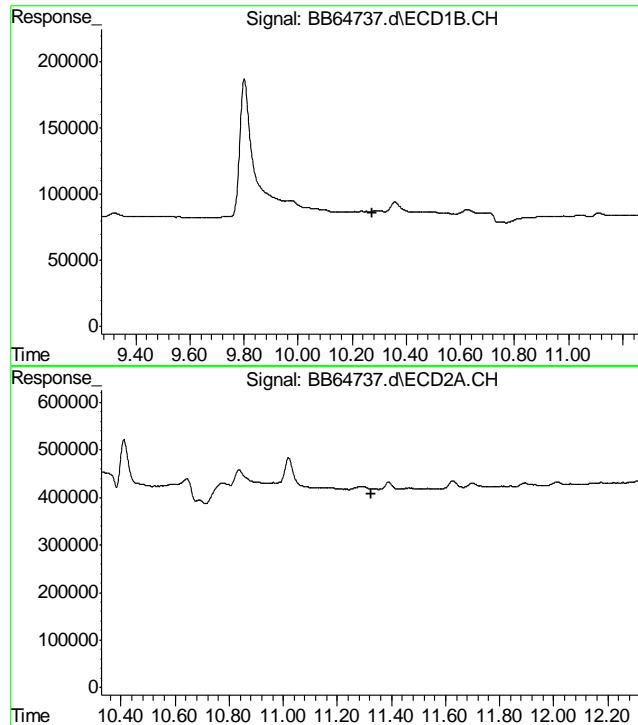
#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.949 min  
Response: 0  
Conc: N.D.



#2 4-Bromofluorobenzene  
R.T.: 6.239 min  
Delta R.T.: -0.006 min  
Response: 2929944  
Conc: 55.78 ug/L



#2 4-Bromofluorobenzene  
R.T.: 6.775 min  
Delta R.T.: 0.002 min  
Response: 32453711  
Conc: 70.69 ug/L



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 10.272 min  
Response: 0  
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 11.326 min  
Response: 0  
Conc: N.D.

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64738.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 02:40:53  
 Operator : nickk  
 Sample : jc4006-2,op44714  
 Misc : op44714,gbb3489,30.36,,,50,,s  
 ALS Vial : 30 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:40:52 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds  
 2) s 4-Bromofl... 6.244 6.771 2999989 33653939 57.183 73.375 #  
 Spiked Amount 50.000 Range 60 - 140 Recovery = 114.37% 146.75%#

Target Compounds  
 1) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d  
 3) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d

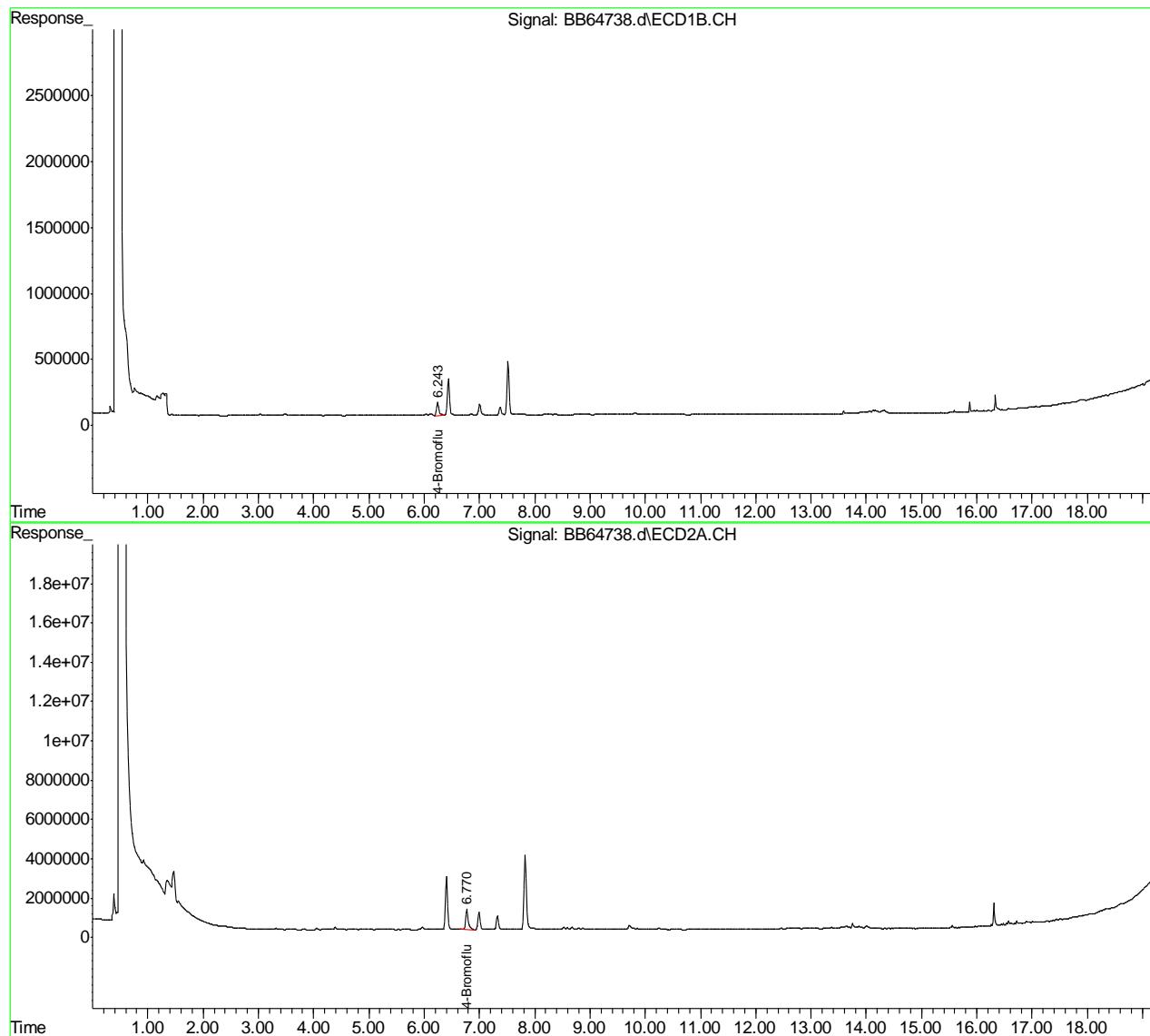
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

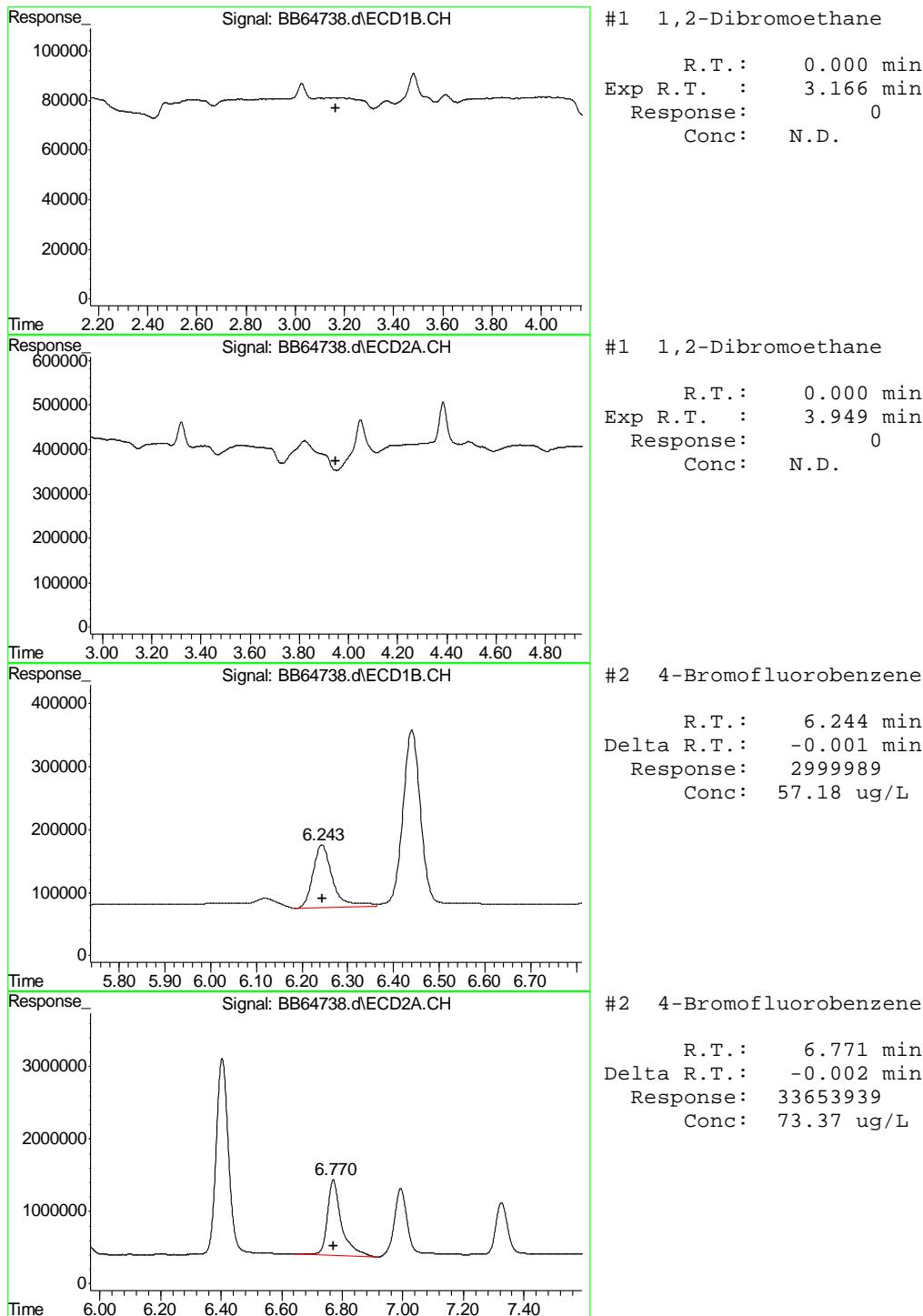
## Quantitation Report (QT Reviewed)

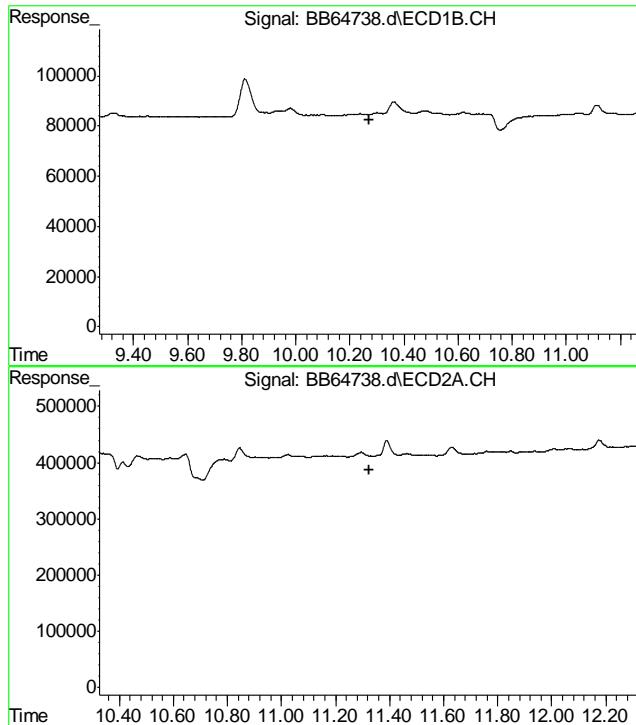
Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64738.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 02:40:53  
 Operator : nickk  
 Sample : jc4006-2,op44714  
 Misc : op44714,gbb3489,30.36,,,50,,s  
 ALS Vial : 30 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:40:52 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :







#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 10.272 min  
Response: 0  
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 11.326 min  
Response: 0  
Conc: N.D.

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64739.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 03:08:43  
 Operator : nickk  
 Sample : jc4006-3,op44714  
 Misc : op44714,gbb3489,30.26,,,50,,s  
 ALS Vial : 31 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:41:02 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds  
 2) s 4-Bromofl... 6.242 6.772 3351673 31373802 64.233 68.279  
 Spiked Amount 50.000 Range 60 - 140 Recovery = 128.47% 136.56%

Target Compounds  
 1) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d  
 3) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

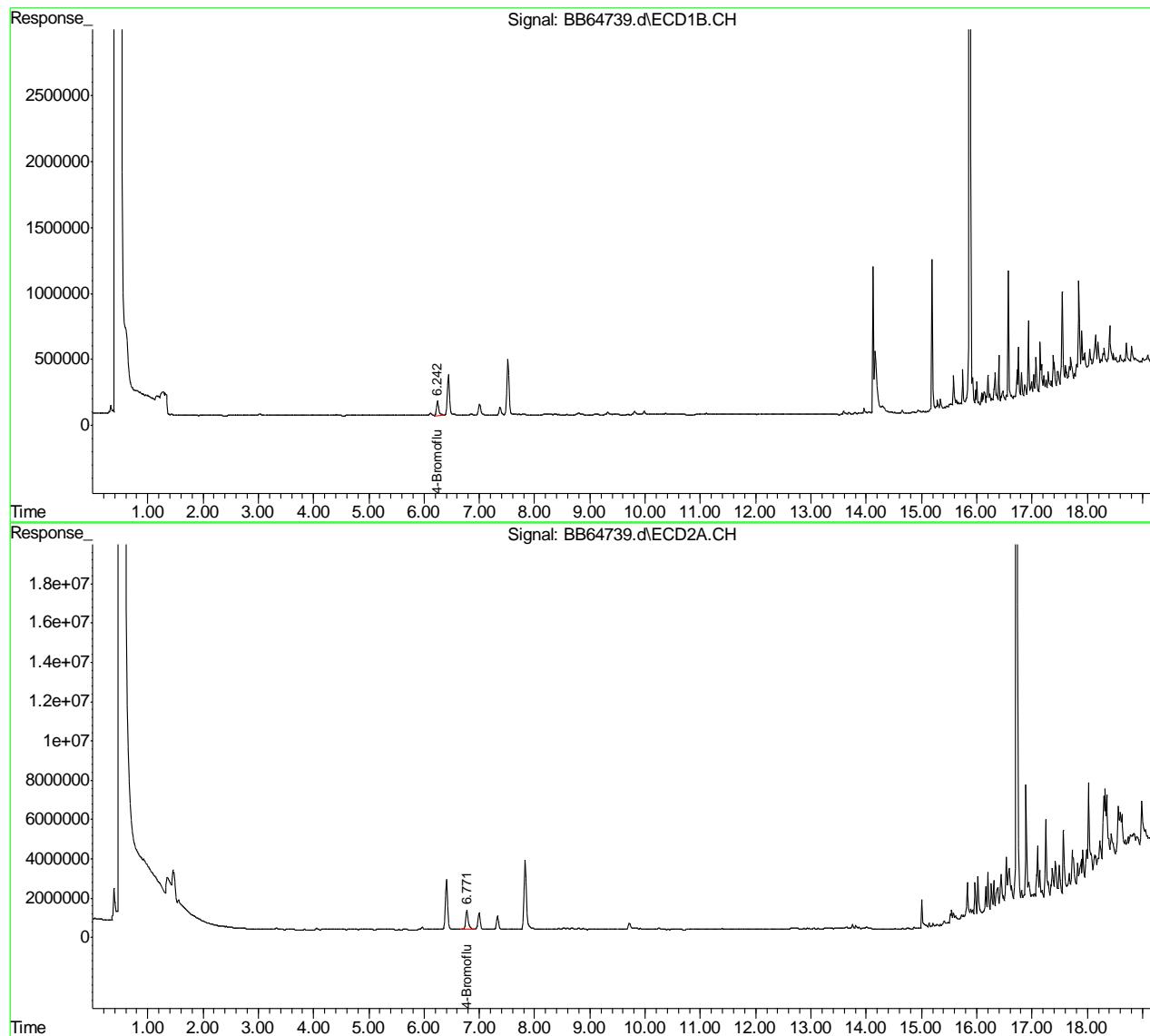
14.1.3  
14

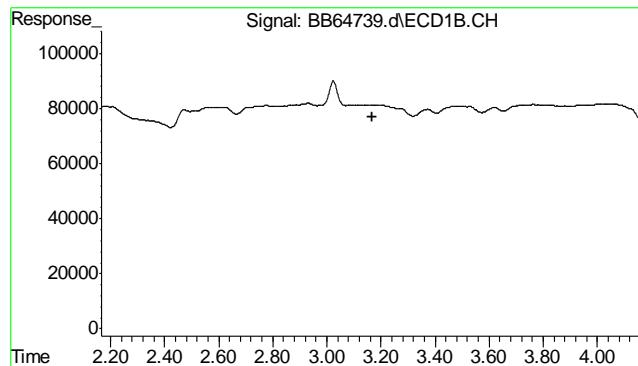
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64739.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 03:08:43  
 Operator : nickk  
 Sample : jc4006-3,op44714  
 Misc : op44714,gbb3489,30.26,,,50,,s  
 ALS Vial : 31 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

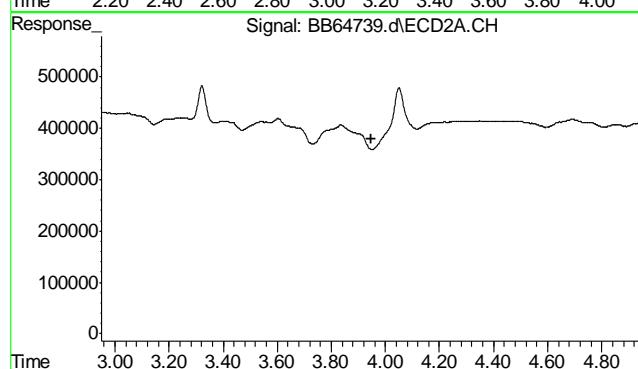
Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:41:02 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

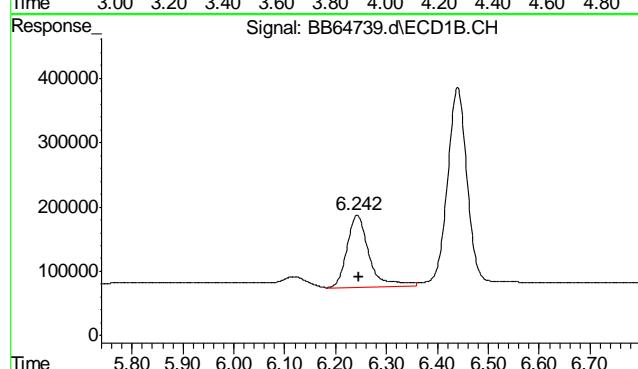




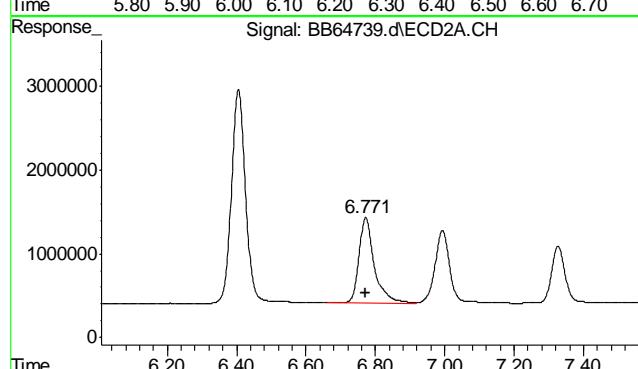
#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.166 min  
Response: 0  
Conc: N.D.



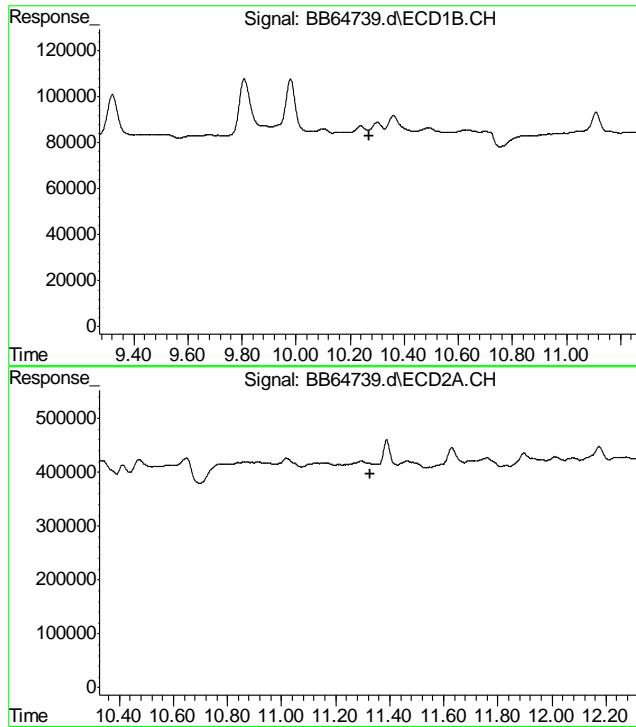
#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.949 min  
Response: 0  
Conc: N.D.



#2 4-Bromofluorobenzene  
R.T.: 6.242 min  
Delta R.T.: -0.003 min  
Response: 3351673  
Conc: 64.23 ug/L



#2 4-Bromofluorobenzene  
R.T.: 6.772 min  
Delta R.T.: 0.000 min  
Response: 31373802  
Conc: 68.28 ug/L



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 10.272 min  
Response: 0  
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 11.326 min  
Response: 0  
Conc: N.D.

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64740.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 03:36:29  
 Operator : nickk  
 Sample : jc4006-4,op44714  
 Misc : op44714,gbb3489,30.36,,,50,,s  
 ALS Vial : 32 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:41:09 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds  
 2) s 4-Bromofl... 6.240 6.777 3148135 34873207 60.150 76.113 #  
 Spiked Amount 50.000 Range 60 - 140 Recovery = 120.30% 152.23%#

Target Compounds  
 1) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d  
 3) 1,2-Dibro... 0.000 0.000 0 N.D. d N.D. d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

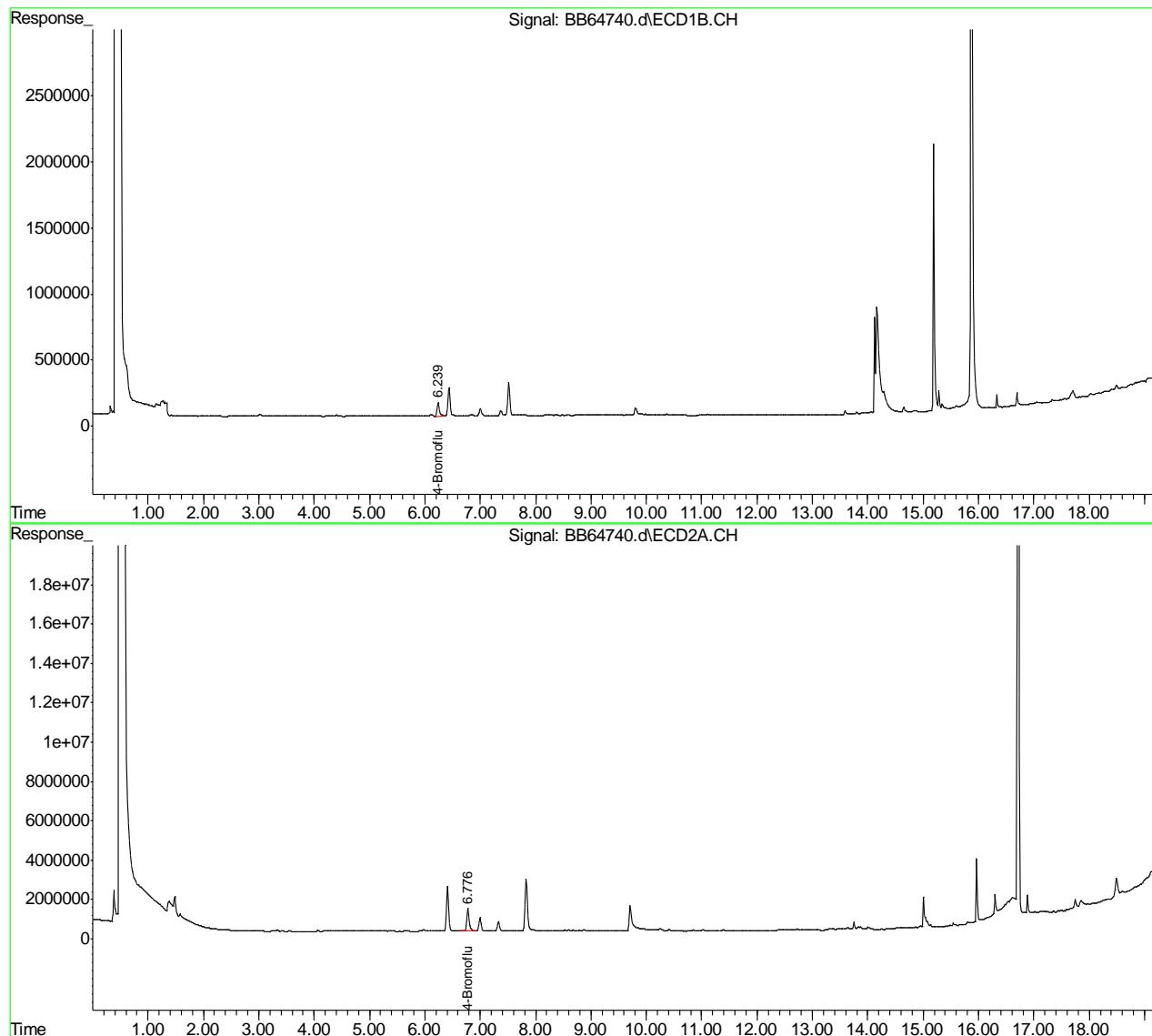
14.1.4  
14

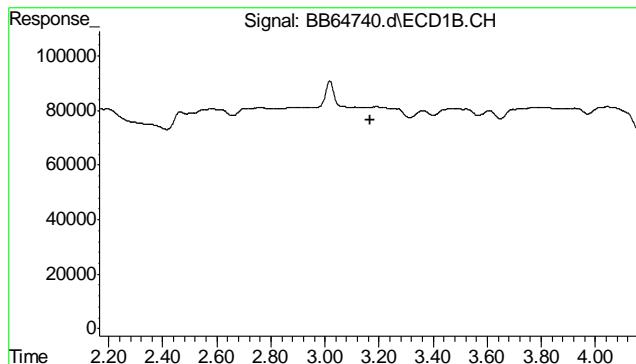
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64740.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 25-Sep-15, 03:36:29  
 Operator : nickk  
 Sample : jc4006-4,op44714  
 Misc : op44714,gbb3489,30.36,,,50,,s  
 ALS Vial : 32 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:41:09 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

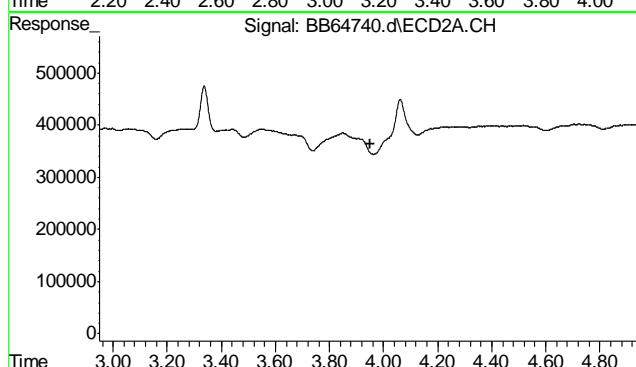
Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :





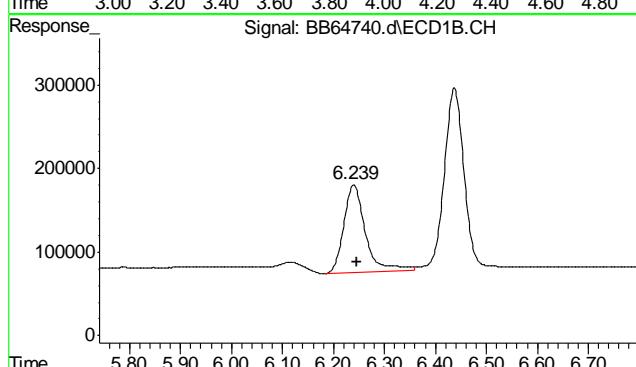
#1 1,2-Dibromoethane

R.T.: 0.000 min  
Exp R.T.: 3.166 min  
Response: 0  
Conc: N.D.



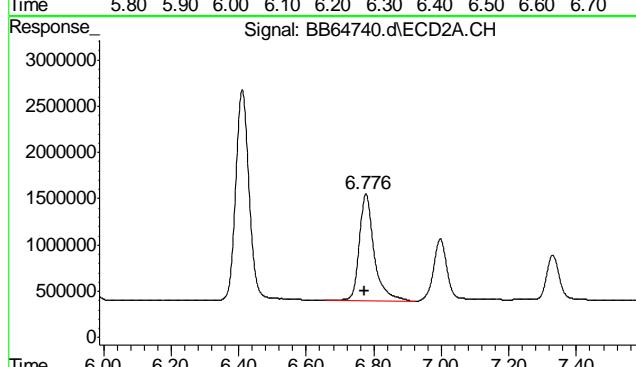
#1 1,2-Dibromoethane

R.T.: 0.000 min  
Exp R.T.: 3.949 min  
Response: 0  
Conc: N.D.



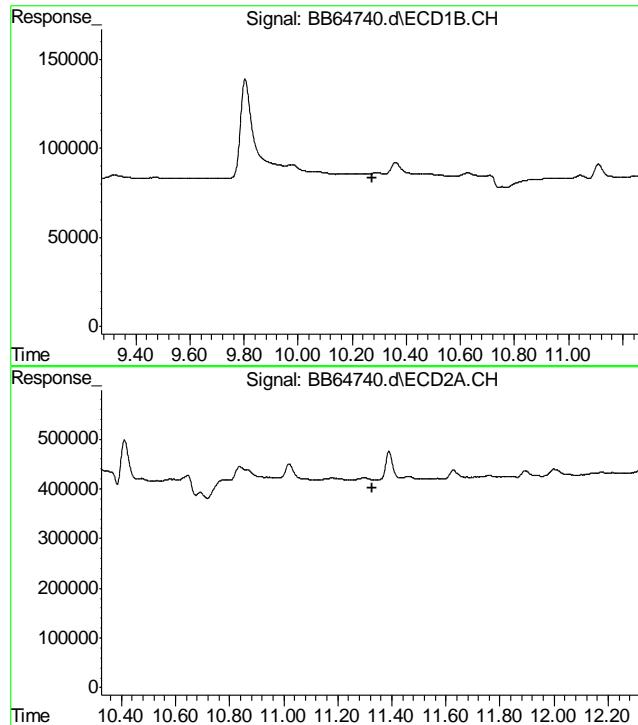
#2 4-Bromofluorobenzene

R.T.: 6.240 min  
Delta R.T.: -0.005 min  
Response: 3148135  
Conc: 60.15 ug/L



#2 4-Bromofluorobenzene

R.T.: 6.777 min  
Delta R.T.: 0.004 min  
Response: 34873207  
Conc: 76.11 ug/L



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 10.272 min  
Response: 0  
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 11.326 min  
Response: 0  
Conc: N.D.

Manual Integrations  
**APPROVED**  
 (compounds with "m" flag)  
 Andri Piluri  
 09/28/15 10:53

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64711.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 24-Sep-15, 14:03:07  
 Operator : nickk  
 Sample : op44714-mb  
 Misc : op44714,gbb3489,30.58,,,50,,s  
 ALS Vial : 22 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:35:47 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
----------	------	------	--------	--------	------	------

System Monitoring Compounds

2) s 4-Bromofl...	6.243	6.775	2773819	24013145	52.658m	52.060m
Spiked Amount	50.000	Range	60 - 140	Recovery	= 105.32%	104.12%

Target Compounds

1) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d
3) 1,2-Dibro...	0.000	0.000	0	0	N.D.	d

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

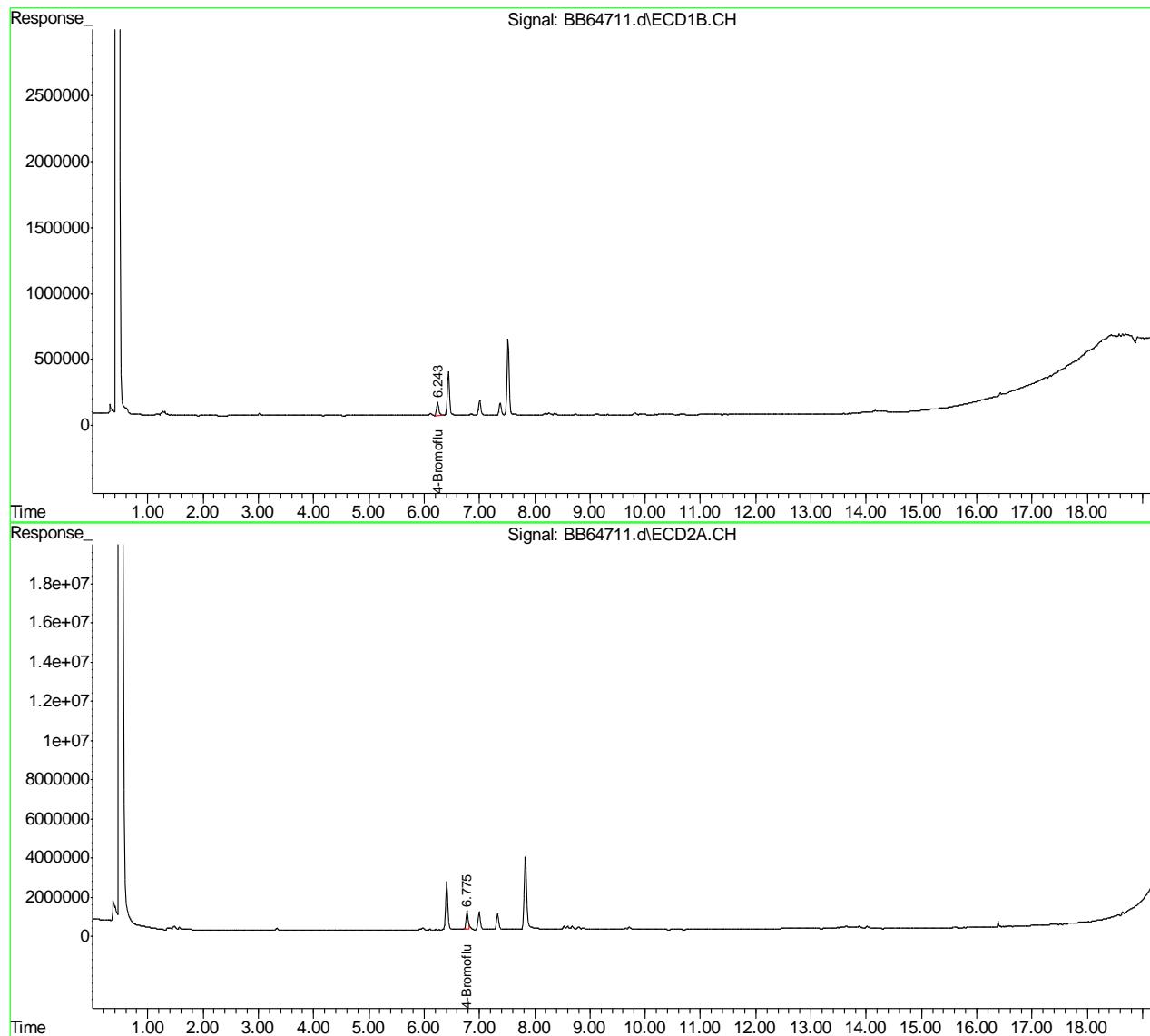
14.2.1  
14

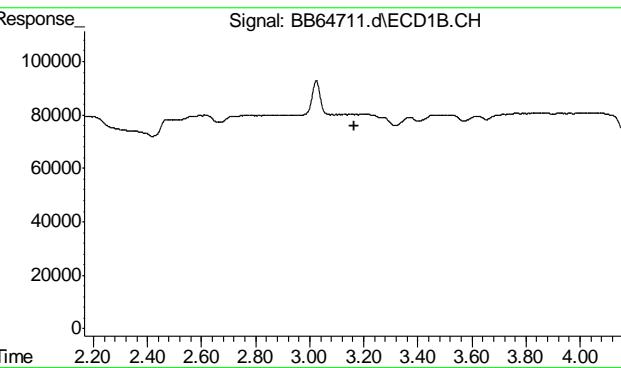
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\BB150924\  
 Data File : BB64711.d  
 Signal(s) : Signal #1: ECD1B.CH Signal #2: ECD2A.CH  
 Acq On : 24-Sep-15, 14:03:07  
 Operator : nickk  
 Sample : op44714-mb  
 Misc : op44714,gbb3489,,30.58,,50,,s  
 ALS Vial : 22 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

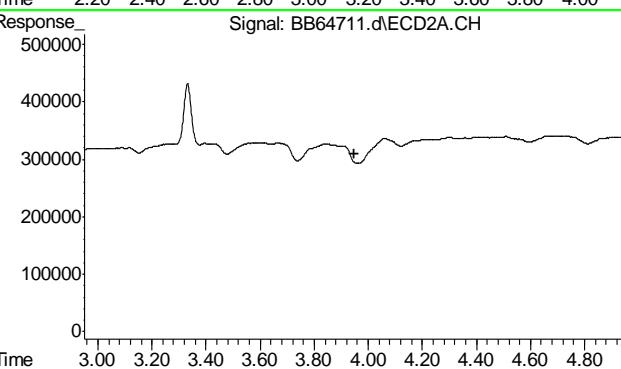
Integration File signal 1: events.e  
 Integration File signal 2: events2.e  
 Quant Time: Sep 28 08:35:47 2015  
 Quant Method : C:\msdchem\1\METHODS\EDS150924.M  
 Quant Title : v8011edb soil  
 QLast Update : Mon Sep 28 08:25:34 2015  
 Response via : Initial Calibration  
 Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :  
 Signal #1 Phase : Signal #2 Phase:  
 Signal #1 Info : Signal #2 Info :

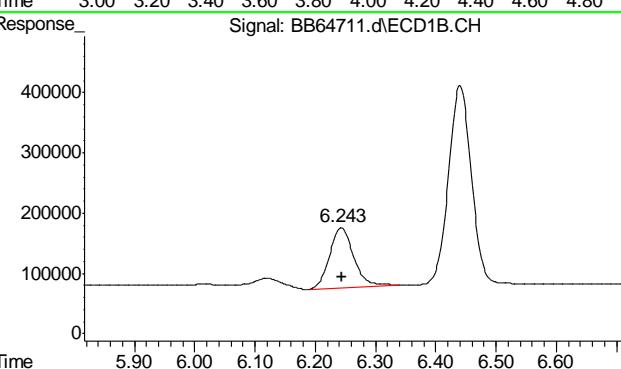




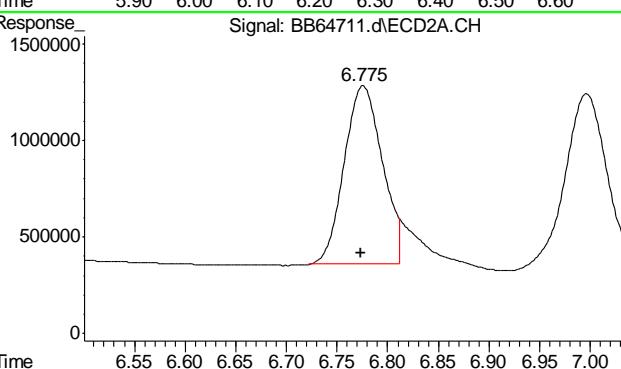
#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.166 min  
Response: 0  
Conc: N.D.



#1 1,2-Dibromoethane  
R.T.: 0.000 min  
Exp R.T.: 3.949 min  
Response: 0  
Conc: N.D.

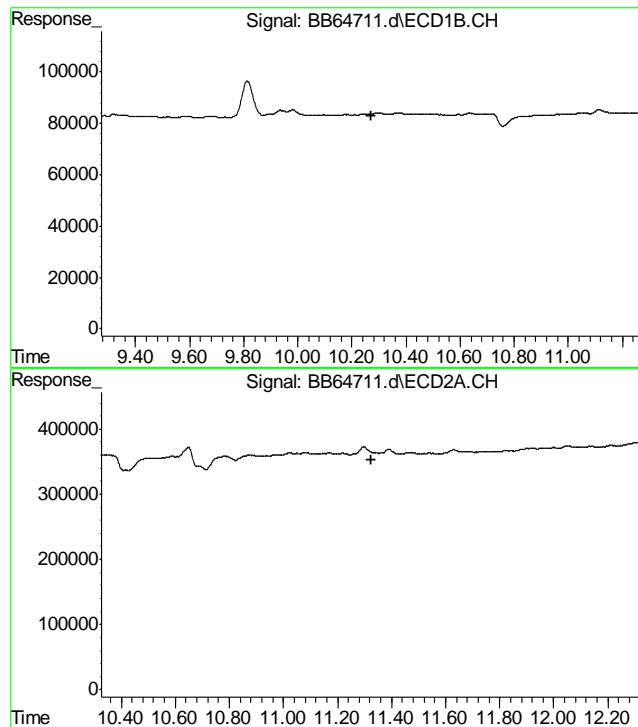


#2 4-Bromofluorobenzene  
R.T.: 6.243 min  
Delta R.T.: -0.002 min  
Response: 2773819  
Conc: 52.66 ug/L m



#2 4-Bromofluorobenzene  
R.T.: 6.775 min  
Delta R.T.: 0.002 min  
Response: 24013145  
Conc: 52.06 ug/L m

14.2.1  
14



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 10.272 min  
Response: 0  
Conc: N.D.

#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min  
Exp R.T. : 11.326 min  
Response: 0  
Conc: N.D.